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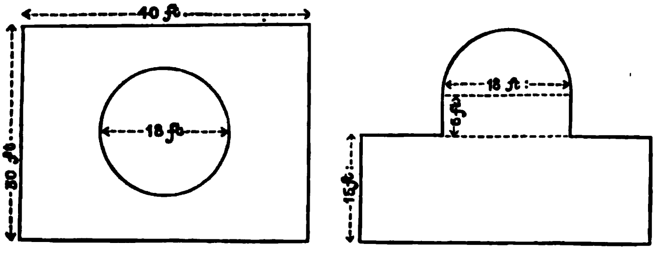

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CONGRESS AT SOUTHAMPTON
(*Continued*).

CONFERENCE OF MUNICIPAL REPRESENTATIVES.

THE proceedings of the Conference commenced with an address by the President, Alderman THOMAS WALTON, J.P., Chairman of the Health Committee, Southampton, which was published in the Journal, Part III., Vol. XX.

"*Unhealthy Areas and Municipal Re-housing*," *by* THOMAS BLASHILL, F.R.I.B.A.
(FELLOW.)

THE housing problem is commonly said to be the great question of the hour, but the term as we hear it used does not always mean the same thing. There is a housing problem which relates to the production of better and cheaper dwellings for the working population, and which is worthy of careful study. But the problem now before municipal bodies is the re-housing, so far as necessary, of persons dwelling upon areas unfit for human habitation. This obligation placed upon the local authority is, under the existing law the most formidable obstacle to the improvement of such areas. Indeed, so far as I know, the most strenuous efforts to cope with it, even at unstinted cost, have failed to secure the results which Parliament and the public sentiment demand.

In these circumstances I propose to submit the question to reconsideration. If my experience as the architect to the Metropolitan Board of Works and the London County Council has afforded special opportunities for this study, my recent retirement makes me free to deal with it impartially, and without pledging anybody but myself.

We all know the kind of districts which the Housing of the Working Classes Act, 1890, calls "unhealthy areas," but which are commonly known by the shorter title of "slums." It is not merely that such areas have serious "sanitary defects"; they must, under that Act, be defects which cannot be effectually remedied otherwise than by an improvement scheme. It is not merely that such areas are overcrowded by a miserable population; they must be "unfit for human habitation." We ought to carefully weigh the phrases as Parliament must have weighed them. Unless they can be applied to an area it ought not to be condemned as unhealthy, but its defects ought to be dealt with house by house under ordinary sanitary laws, which for that purpose require to be considerably strengthened and more steadily enforced. But if an area is unfit for human habitation, and irremediable otherwise than by an improvement scheme, the case fully justifies such exceptional measures as will produce the "effectual remedy" contemplated by the Act.

The legislation promoted during the last half century by Lord Shaftesbury, Mr. Torrens, and Lord Cross, and which was revised and consolidated in the Act of 1890, shows a steadily-increasing effort to procure the amendment of unhealthy dwellings and areas. But it also shows an increasing determination to provide for the persons displaced, so that they may not suffer unreasonable loss by removal, and may not increase the over-crowding in other districts. One of the requisites of an improvement scheme under the Act of 1890 is that it shall provide wherever required "accommodation for the working classes displaced." The repeated references throughout the Act to the persons displaced show that Parliament contemplated the rehousing of the very persons found living upon the area.

It is often assumed that provision for a similar number to those displaced and required to be re-housed is a substantial compliance with the Act; but this cannot be so. New buildings take many months to complete; and if they are not ready when the people are turned out, or if the people do not enter them, and are not provided with other vacant accommodation, they are at once dispersed, and the mischief is done. To house a similar number of persons, probably of a different class, who never lived in slums, who may not have lived in the neighbourhood, who may even be new-comers to the town, cannot be said to make room for persons displaced two years before, or in any way to mitigate the evils which the legislature foresaw. It is therefore clear that an improvement scheme should provide reasonable accommodation for the persons turned out.

I am only imperfectly informed as to the operation of the Housing Act in provincial towns, but it appears that in proportion to the need for improvement schemes, very little has been done. The cost of clearing unhealthy areas must, I think, have been discouraging, but it may be that in some places, as in Liverpool, re-housing has been carried out with more success than in London. A statement of the money expended under the Housing Acts in the Metropolis, and the results achieved, will be instructive.

I may say, in the first place, that from the institution of the London County Council, it took up with the greatest energy the work of the Metropolitan Board in dealing with unhealthy areas. Where possible it has endeavoured to improve on the old methods. The Board disposed of its cleared areas, as suggested by the Act, to public companies and to individuals, who carried out its obligations to provide new dwellings. The Council has itself undertaken this duty. While the great bulk of the work has been done through its own architect, an amount sufficient for comparison has been designed and some has been carried out by private architects specially experienced in this business. It has employed contractors, and it has built by its own workmen. Moreover, it has endeavoured so far as possible to provide new accommodation before the inhabitants of a cleared area were turned out. It has, in fact, taken very great pains to secure the best results.

A return made up to the end of the year 1898, of schemes completed and schemes to which the Council was then pledged, shows that since 1876 the Board and the Council had spent, or undertaken to spend on improvement schemes, the sum of £2,835,227, and that the receipts, actual and estimated, from sales, with the estimated value of property in hand, would amount to no more than £668,860. This shows an estimated deficiency or loss of £2,166,367. The total number of persons displaced will amount to 39,207, and accommodation for a few hundreds more will have been provided. The work has therefore been carried out at a net cost of £55 per head of the persons removed. But some of these schemes have been combined with street improvements, and other disturbing elements, and this amount is probably too high. I have, however, no doubt that, apart from all such complications, the net loss on the Council's housing schemes amounts to £45, or possibly £50, for every person displaced. The new dwellings, taken one with another, are just remunerative, so that the loss arises from dealings with the land, compensations to the various interests disturbed, and laying out the sites for rebuilding. The property on an unhealthy area has to be bought by the local authority at its fair market value; the value is then sacrificed, except a small portion which will arise from its use as a site for artisans' dwellings, and even this can only be recovered by the costly process of laying out the area afresh and forming new roads and sewers with all the convenient and needful arrangements of a new building estate.

Persons with a turn for calculation will say that, at less cost than is incurred by these schemes, every head of a family removed might be established in a promising business, or the whole population might be settled down in our most prosperous colony; but all such speculations are vain. These people—born and reared for the most part in the very centre of the world's commerce, inhabiting the place, of all places, which offers the most bread for the least work, towards which at this moment, and at every moment, tens of thousands (provincials, colonials, aliens) are trooping never to return—these neighbours of ours stand shiftlessly peddling in the streets which, as everybody but a Londoner knows, are paved with gold. It is for them chiefly that the demand for re-housing is raised. Let us see how it is met.

Some two years ago an inquiry was made as to the number of persons inhabiting the buildings put up in improved areas, and no more than twenty were actually found. We may hope that the number is greater; but it is pretty clear that practically the whole of the 33,000 or more who have already been displaced have gone to other districts, where they must have increased the over-crowding which Parliament and the Council and everybody had hoped to prevent. The cause of this failure to re-house is easy to understand.

If the clearing of an unhealthy area is troublesome and costly, re-housing has difficulties of its own. In the formation of the scheme the Government requires you to provide out of the rents a sinking fund to replace the cost of the new buildings in sixty years, when 100 years would seem more reasonable; and it requires you to replace the cost of the land in the same period—though no outsider can see why this should be replaced at all. The Home Office and the Local Government Board require that the new accommodation shall be fully equal to the latest standard for a healthy dwelling. Thus, the number of rooms, their area and their height, the size of the windows and their position, the communications between room and room, and between rooms and staircases, so as to secure thorough ventilation for each room of each tenement, are subject to the strictest scrutiny. The Public Health Act controls the sculleries, sinks, and closets, with their pipes and drainage. Building Acts and By-laws dictate the construction of foundations, walls, and roofs, and in London, at least, most strictly enforce their demands as to heights of buildings, widths of streets in front, and of open spaces in rear. The practical man brings his suggestions of useful contrivances and modes of finishing that will cost so little, and will be found cheapest in the long run. Then we have the critic who is not satisfied with such architecture as that of Harley Street or Bloomsbury, or Marlborough House. Last of all comes the philanthropist. Should there be such a one at this Congress I will claim his indulgence for a moment. Where the others leave off he begins. Having struggled for cottage dwellings, with restful greenery in the middle of the town, and protested against block dwellings in any shape, he will perhaps tolerate such as are only three or four stories in height. Then the staircases are too narrow and too steep. One of the kindest and most reasonable men I ever met urged the provision of lifts. The food cupboards, clothes cupboards, and washhouses are insufficient; and all the rooms ought to have a south aspect. If everything is not rectified to his satisfaction he pursues you on platforms and in the magazines. As something of an enthusiast myself, I sympathise with him to a certain extent. He is almost the only one who does not get everything for which he asks. When the dwellings are ready for occupation your troubles begin.

Setting aside for the moment, but by no means forgetting, a small proportion of the dwellers in slums who have been brought down by unforeseen circumstances to that position, and are fitted for a better mode of life, the bulk of the persons who have to be re-housed find the arrangements of the new dwellings, whether cottage or block, new and distasteful, and the regulations all but impossible. The cooking arrangements are beyond them; they have never before had to keep their dwellings clean, and their modes of getting rid of refuse have been different, radically. If they are willing to face the matter, you have to explain the root ideas of health and decency. But to tell the family of six living in one room, as you must tell them, that they will have to take three rooms, and pay an increased rent of three shillings a week, settles the matter finally for them. They have not got the money, and if they had, they would not spend it in that way. They will stay on in their old room till they are removed by law. The magistrate will not help you to turn them into the street, so for three months more, unless bribed to go, they delay the improvement of the area, after which time they disappear, and are lost. You might be disposed to pay their increased rent for a time, but you have squandered your money under parliamentary compulsion; first, in buying up an uninhabitable area at the price of an inhabitable area, and next in extinguishing its commercial value. You have already spent some £300 in removing this family of six, and how can you go again to the pocket of the ratepayer to re-house them in costly habitable dwellings at their former rent? These people must go away, and the new dwellings must be let to new tenants, who can pay the rent out of which the interest and sinking fund have to come.

In view of such considerations as these, I have long since come to the conclusion that an Act so costly in its operation, so destructive of valuable property, and which fails to carry out one of the main objects at which it aims, ought to be replaced by new legislation. We want an Act which will destroy only the slums, which will leave to every owner the true value of his interest, which will actually re-house or resettle every person displaced who is capable of being so dealt with, and will not be an unreasonable burden upon the rates. Let us look into the whole question afresh, and consider what would seem a strictly fair arrangement if we were untrammelled by the precedents created by former Acts.

Imagine a duly certified unhealthy area, and suppose it to be in the hands of a single owner, or freeholder, who lets the tenements direct to the occupiers. Is it conceivable that anyone would propose to buy him out at the fair market value of his property on the assumption that he might continue to let it to a reasonable number of tenants, or use it in any other way open to him, that thereafter the local authority should sink the commercial value, except for re-housing, and take the whole burden of reclaiming this uninhabitable area at such a cost per head of the population as I have named? Would he not be told to clear his property of its inhabitants, after due notice and necessary delay, and to render it fit for human habitation at his own cost before it could be again inhabited. And would not the local authority be doing all that could be expected from them if they undertook to look after the re-housing of the former inhabitants, so far as was necessary for their immediate comfort, and to prevent mischief to the general community?

If that is the way we should treat a sole owner, why should we deal on different principles in a case where there are several owners, and a variety of other interests? The complicated system of ownership, which the law allows, is no affair of the local authority, it is the concern of the owners, who in various ways have inherited, or bought, or perhaps helped to create the complication. To deal with them on the same principle as we should apply to the sole owner, presents no serious difficulty.

Upon the issue of an order declaring an area to be unfit for habitation, the freeholders should be directed to form a Trust for the improvement of their property. The Trust would acquire, through an official arbitrator, all leasehold interests at their fair market value, under all the actual circumstances. The inhabitants would enjoy fixity of tenure on payment of rent until the local authority could get them settled elsewhere. No new inhabitants would be permitted to enter upon the area. Under the supervision of the local authority and the government department, the Trust might acquire any adjoining property absolutely necessary for the improvement of the area, as such property is acquired now.

When all this had been done, and the inhabitants had been removed, the Trust would demolish the houses, widen the streets, and make the property marketable without any restriction as to its purpose, and without any sacrifice of its value. It is this value, at present lost, which would enable the owner to carry out the improvement, and its retention forms the "backbone" of this scheme.

We now come to the dealings of the local authority with the occupiers, bearing in mind that up to this point the local authority has expended nothing on the estate. Every family would be scheduled in the first instance, and its position investigated. It would then be seen who was fit for re-housing, who must of necessity be re-housed on the site or near thereto who might be settled beyond a radius of a mile and a quarter and who might be accommodated in the outskirts of the town.

Very few, indeed, of the ordinary residents would be able to show that they could not carry on their business within twenty minutes' walk of their old homes. Many of those removed to a greater distance away would have to be reasonably compensated for their travelling expenses. Many might go even to the suburbs, now that trams and trains are being cheapened for the especial benefit of their class. I have heard of an owner of houses who had to turn out his costermonger tenants while he executed repairs. They went outside the County of London, and when he sent for them they said they had been wheeling their barrows in their new district, and there they would remain. Factories are being removed to the suburbs, and everything is in favour of the removal of the working class, who would only be following the example of other classes who left the crowded central districts two generations ago.

There would remain a portion of the population that ought to be re-housed in their old neighbourhood. For these the Local Authority would acquire land, and would build. It would probably buy the land from the owners of the insanitary areas. In like manner, if the Local Authority desired to combine a public improvement, such as a new street, with the scheme, it might suitably compensate on terms to be fixed by arbitration.

If it should be necessary to build for those removed to distant localities, Part III. of the present Act would enable this to be done. The great majority would, however, be re-housed in vacant tenements, which can always be found at some distance from the centres of population, if time be given for the search. I do not know who originated the idea of re-housing the most impecunious class in our towns in brand-new houses—they who never wear brand-new clothes. If you want them to live in new and improved dwellings, you must teach them to earn more money. This idea, which we cannot pursue now, is really at the root of all housing problems.

None of the persons removed would be allowed to overcrowd their new dwellings. The family of six that has occupied a single room at 5*s.* 6*d.* a week would be put into a three-room tenement at 8*s.* 6*d.*, and the extra three shillings would be allowed to them as compensation. The persons taken into the new buildings on or near the area would be provided with ample accommodation at a reduced rent. These compensations would come out of the funds now being expended on reclaiming the site.

Compensation, except for removal, should on no account be paid in cash. When the Metropolitan Board paid substantial compensations for disturbance, the money was wasted without delay. Men who desired to take care of their money were hunted down and robbed. I think there was one murder. A crafty occupier who had been so compensated would choose another unhealthy area for his next home, so as to be compensated a second and a third time. The total amount for improved accommodation and travelling expenses should be paid direct to the new landlord as part of the weekly rent so long as the tenant stayed with him under satisfactory conditions.

With regard to the period during which these indulgences should continue to be granted we must bear in mind that these people will have been removed from an area dangerous or injurious to their own health or unfit for human habitation. They cannot expect to be provided out of public funds with healthy dwellings for life, though the present wasteful expenditure would no doubt go far towards doing this. It may be expected that they will learn better habits from better surroundings, and become more able to pay rent. It may be a question whether the duration of the compensation should be three, five, or seven years. If at the end of the allotted period a family had made no progress in self-dependence they would simply lapse into the class from which they had been taken, except that there would be, we may hope, no unhealthy area for them to inhabit, and there would be none of the pressure that results from wholesale evictions.

The fund for compensation would of course be provided by the ratepayers, and administered under Government supervision. It would probably not amount to a fourth of the present expenditure on schemes which do not re-house. Its administration would require a larger staff than is now employed, but it would not be unreasonably difficult. I must, however, now leave this branch of my subject to the candid consideration of those who, as members or officers of local authorities, can bring to bear upon it the wider knowledge and more varied experience which a matter of this importance demands.

So far I have been seeking a substitute for Parts 1 and 2 of the Act of 1890. But one portion of Part 2 deserves special consideration. I do not know whether it has occurred to any local authority to avail itself of the sections that relate to obstructive buildings. Under this part of the Act, if a building, although unobjectionable in itself, stops ventilation, or otherwise makes, or conduces to make, other buildings unfit for human habitation, or dangerous, or injurious to health, or prevents their improvement, the local authority may buy it and pull it down. This is sure to be an expensive operation, even allowing for the recovery from their owners of any increased value given to the buildings benefitted. Surely it would be only reasonable to require the owner of the building overshadowed to pay the full cost of such a purchase, or to close it until he had made it fit for human occupation. In such a case, and in all others where only a small number of houses had to be closed, the public interest would not require any scheme for re-housing.

In housing matters we have been long trying to make up for generations of neglect. So far the progress has been very slow. I bring forward this scheme as a practical, an economical, and an expeditious substitute for the Housing Act of 1890, which is costly and dilatory, and wholly inefficient in respect of the re-housing of persons displaced.

[*For discussion on this paper, see page* 14.]

"*Housing of the Working Classes*," *by* CHARLES J. HAIR, A.R.I.B.A.

(MEMBER.)

I HAVE been asked by your Committee to give you my views on the housing problem. It is with some diffidence that I address you, as I understand that Mr. Blashill, the architect to the London County Council, has given you an exhaustive paper on the subject, based on the long experience he has had in dealing with this problem in London. I will, therefore, confine myself to giving you a few of the practical difficulties that are usually met with in dealing with this matter, from an architect's point of view, and the way in which they are usually overcome. The main points which an architect has to bear in mind at the outset are :—

1. *Site.*—It is generally found that the first of the new buildings have to be of a kind that will re-house the people displaced on the same area of ground, and consequently they must, of necessity, be several stories in height, in order to get sufficient air space between the different blocks. The land generally has such a high commercial value that it is impossible to make a profit by building workmen's dwellings, unless a prohibitive rent is charged for them. This can partially be overcome, in some cases, by devoting the lower part of the building to shops, and thereby getting a commercial rent for valuable frontages.

2. *Class of dwellings.*—The next point to be considered is the kind of dwelling to erect, whether to re-house the people in lodging houses, or artisans' dwellings, and if the last named, whether they shall be "self-contained," *i.e.*, each flat a separate cottage in itself, or "associated," *i.e.*, rooms let off separately with common sculleries and w.c.'s.

Of course, one should be governed by the class of people that have been turned out, and give accommodation accordingly. Here I think I am right in saying, that up to the present it has been found impossible to get the very poorest (who are generally the class that has to be catered for) to inhabit the new buildings.

3. *Economy of Design.*—The third and perhaps the most important point to the architect, is that he must bear in mind that the buildings have to show a sufficient return to pay for themselves in 30 years, and consequently everything must be designed with a strict regard to the cubic inch; for instance, if all the partition walls in a big building are made 2½ in. thick, instead of 5½ in. (which is the finished thickness of a 4½ in. brick wall), a saving will be made of a foot in every 60 ft., and in a five-story building this means over £100. The architect must also suppress to a certain extent the artistic side of his nature and be severely practical in regard to design. As I had it very aptly put to me once, "If he must introduce 'poetry' into the elevations, it must be *very cheap* 'poetry.'" I think it is possible to make a quite plain building look well, by keeping each feature of good proportion and making a speciality of the cheaper kinds of ornamentation; for instance,

broad bands of light-coloured bricks have a wonderful effect in brightening up a big building.

I now come to speak of the buildings themselves.

Lodging-houses.—First as to lodging-houses. I think this class of building is the nearest approach to re-housing the poor that has been made, this is chiefly due to the fact that everything is concentrated, there is a general kitchen, living room and scullery, common to all the inmates. The dormitories are plain, square rooms, divided off into cubicles, and have no chimneys, this is a very serious expense in other classes of workmen's dwellings. Again, the sanitary arrangements are all concentrated to one or two points. The administrative and staff quarters are the most expensive part of the building.

The first main idea for a lodging-house is a big common room on the ground floor, with dormitories above. As a working man said to me once, why not build a big shed that could be opened on one side, cover the floor with asphalte, and turn the hose on it every morning. But now-a-days we want something a little more elaborate than this; and in place of the one common room, there are dining and recreation rooms, kitchens, lavatories, bath-rooms, box and locker rooms, to be provided for, to say nothing of washhouses and storerooms, &c., for the administration of the building.

The dormitories have to be divided into separate cubicles, so that each individual has a room to himself.

This kind of building has been made to pay in London, and if it is possible to give this extra accommodation, so much the better; but I think that a somewhat cheaper scheme should be devised in the poorer districts to compete with the demand for a 4d. doss. This can only be done by doing away with the greater portion of the administrative accommodation. Following page 16 is a diagram of a lodging-house of this kind, which would accommodate 96 men if built two stories high only. This building is designed somewhat on the lines of existing lodging-houses in this town (Southampton), though with extra sanitary accommodation. The plan is composed by placing two large dormitories 40 feet apart, and planning the entrance and staircase between them. The entrance is flanked on the left by the check-taker's office (which is placed in this position so that he can supervise the entrances to the dining-room and staircase), and on the right by a cloakroom, which would be fitted with lockers for the use of the lodgers. The right wing of the building contains the dining-room and kitchen, and the left wing contains the caretaker's house and lavatories and bathrooms for the men. The w.c.'s are placed at the back, and are open to the yard, but there is a covered passage to them from the central hall. The upper floors consist of two dormitories, which are on the left and right of the central staircase. Two w.c.'s and a sink closet are provided on each floor, opening off the staircase corridor. I propose to heat the building by means of central stoves for the dining-room and open chimney hearths elsewhere. The baths would be heated by gas, as the addition of a boiler-house would be too expensive. I have also made no provision for a laundry, as in such a small building it would not pay. This is only a rough outline of the scheme, but I think it would be possible to make it pay at 4d. per night.

Artisans' Dwellings.—This is perhaps the most popular form of re-housing the working man, as it provides separate dwellings for each family. There are two kinds of artisans' dwellings, the self-contained and associated. The self-contained is, I believe, the most successful plan.

In the dwellings which I have in hand for the Southampton Corporation there are one or two points which I think are improvements on some of the earlier forms of dwellings. The most important is that the w.c.'s are disconnected from the living and sleeping rooms. I have often noticed that in plans of model dwellings the w.c. is put next to living rooms and bedrooms, and in some cases even between two of these rooms. The most important point to aim at in designing this class of dwelling is to get as many rooms as possible opening from each staircase. In this case there are three tenements on each floor, and each has its front door opening directly on to the landing, so that no room is wasted in corridors. In squaring out a plan for comparative cost, corridors form a big item of expense and give no return; this is a great drawback to the associated plan. These dwellings all enter through the sculleries, which is an advantage, as it acts as a disconnecting lobby between the living room and the stiarcase. In cases where the living rooms open directly on the staircase, complaint is often made of the noise and dust from the traffic up and down the stairs. Each scullery is provided with a sink and a copper, and has two windows, one opening to the staircase. The coppers are set in the chimney breast with the flues on either side; this is done for economy of space, and also to provide a steam flue to carry off the steam when the coppers are in use. The same flue is used for steam and smoke, but is furnished with a damper so that the steam is only admitted to the flue when required. The circular fronts to the copper furnaces are of glazed brick.

Each living room is provided with a food cupboard, ventilated to the open air, and a dresser with plate rack over.

With regard to sanitary fittings, the sinks are strong stoneware, specially made 10 ins. deep, and connected to 2 ins. galvanized iron wastes, with drawn lead pipe with a trap under each sink; the upper end of the waste is taken up 4 ft. above the eaves for ventilation. The w.c.'s are of strong fireclay, and the soil pipe is ventilated at the top, and has special screw inspection caps at each connection; this is most important, as in case of a stoppage, it can be put right without breaking the pipe. The ventilating pipes from the soil pipes to the front elevation are terminated with a Boyle's Extract Ventilator, which is enclosed in an ornamental turret.

Dust.—The difficulty of providing for the disposal of dust and house refuse has been overcome by the provision of a dust shoot opening off each landing, which is constructed of 9-in. glazed stoneware drain pipes, built into the wall, discharging into a movable receptacle at the bottom and the top of the pipe, ventilated above the eaves.

Balconies.—There is one thing which I think would be an improvement to this plan, and that is small balconies to each tenement.

The ground floor has been devoted to shops on the street front, and the entrance to the dwellings above is from a common yard at the back of the building.

I have also prepared a plan of associated Artisans' Dwellings. This has one advantage, that single rooms can be let to the very poor with the use of common scullery. The objection to this plan is the amount of room lost in passages; this is to a certain extent counteracted by the concentration of sculleries and w.c.'s.

Materials.—With regard to the materials the most important thing to remember is that everything must be as fireproof as possible.

For walls, good bricks are the cheapest and best materials, though I don't think the time is very far off when we shall make a greater use of concrete for building walls. There is a very good hollow fireclay brick made by the Shepwood Co., 2½ in. thick for internal walls which can be bought either glazed or plain, or with a fluted surface for plastering. These were used in the bath rooms and w.c.'s at the lodging houses here, and are, I consider, a great success.

Glazed Bricks.—This is the best and most sanitary building material that can be made, but has the drawback of being very expensive; however, I think that it is the only material that should be used for dados in corridors and staircases, and round sculleries and w.c.'s and quite justifies its extra cost, although it is generally the first item that is cut out when the cost of a building has to be reduced. To clothe the walls of a scullery from floor to ceiling with glazed bricks would be extravagant, but it is a necessity as a dado.

Floors.—These have to be of concrete, and the most usual form is 6 in. thick on rolled steel joists, the concrete being made either with furnace clinker or coke breeze. This is at present the cheapest kind of concrete floor, but has the drawback of being very heavy, and I believe that when the nature of concrete is better understood, these floors will be made about 3 in. to 4 in. thick, in fact I have done them 4 in. thick, but only in small rooms. There are several patent floors made, but I have found it best and cheapest as a rule to stick to the plain solid concrete and steel joists.

The best coverings for floors are 1-in. boarding for living and bed rooms, nailed directly to the concrete, and a rendering of granite dust and cement for sculleries and w.c.'s.

Stairs.—Stairs should be constructed of good granite concrete moulded in situ, and should be ventilated by large unglazed openings on each landing.

Roofs.—There are, broadly, two kinds of roofs—"pitched" and "flat." The pitched roof is the best for appearance, and also for keeping out the wet, but has the drawback that it is not, as a rule, fireproof. The flat roof is fireproof, very ugly, and in crowded districts it can be made use of as a playground for the children, or as a washing and drying-ground.

[*This discussion applies to the two preceding papers by* MR. THOMAS BLASHILL *and* MR. C. J. HAIR.]

Councillor WOMERSLEY (Leeds) said that he had had some experience in this matter, and had seen several specimens of re-housing in different parts of the country. Most of the schemes were splendid, but they were not practical. Personally he felt a good deal discouraged in dealing with this subject of unhealthy areas. In Leeds they had taken upon themselves the responsibility of dealing with sixteen acres. They divided the area into four parts. They had accomplished about a fourth of it, and he was not sure that they would touch any more of it. In the first place they found it so very costly; in the second place he thought they were doing an injustice to the present dwellers in the slums. He had come to the conclusion to do all he could in connection with his Authority to carry out the

Act to the best of his ability, but they had a great deal of difficulty in dealing with obstructive builders. The Act allowed them to do two things to improve the health of the people, viz., to let in light and air. They were going to spend ten thousand pounds in Leeds in this direction, and he did not know but that they could do as much real good in that way as if they were to spend three hundred thousand pounds. It was the cheapest way of dealing with unhealthy areas. He did not think any municipality had the right to spend hundreds of thousands of pounds in this way and lay the whole burden on one generation. In adopting this Act it was necessary to use the greatest caution so as not to entail hardship on the present dwellers. It was, for instance, a hardship on a man, who earned but very little, to ask him to pay a rent of about six shillings a week. He did not think the Local Government Board were showing all common sense in connection with this question. They insisted upon houses being built that could not possibly be let under six shillings and sixpence per week (such as a series they were now building at Leeds), and they were being built for a class of people who did not now pay three shillings and sixpence a week. It did not meet the case. They were told that it was a question of moving up, but he did not think they were justified in incurring such a vast expenditure in the work.

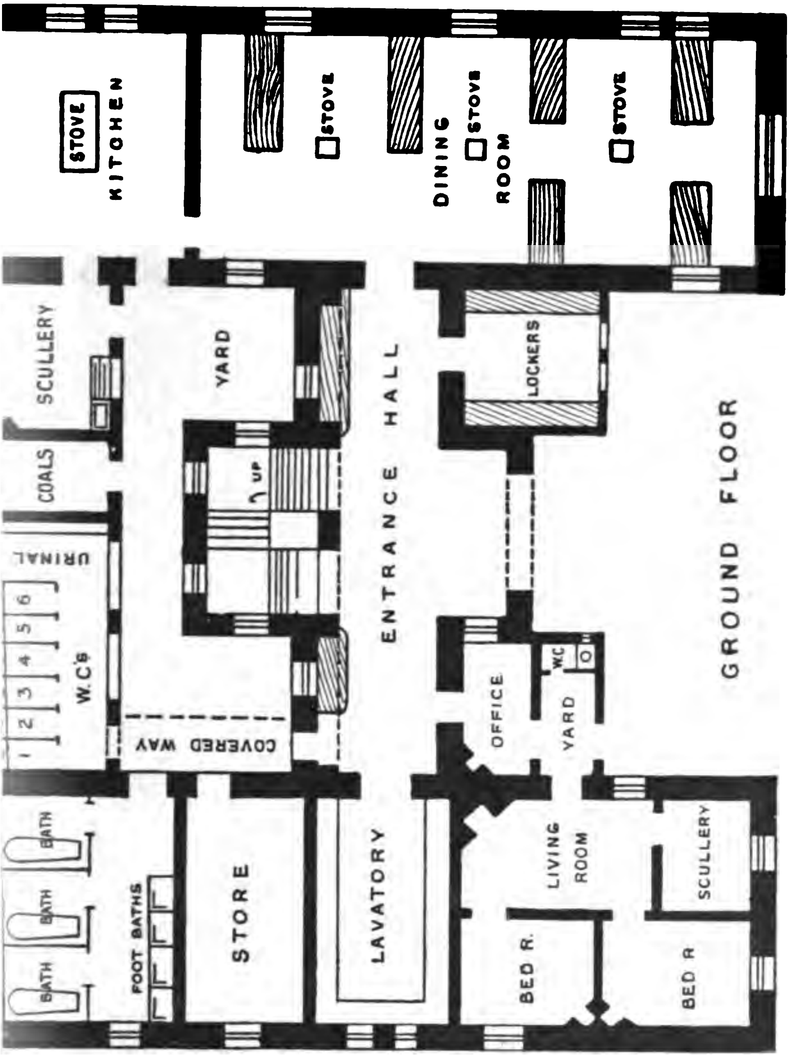
Alderman **Purcell** (Liverpool) said he believed they had hold of the best end of the stick in Liverpool over this re-housing question, and had done better than they had done either in London or Leeds. When they woke up years ago and found that the people were not housed as they ought to be they realised that they had a very serious problem to face. They found some 14,000 or 15,000 houses that were structurally insanitary inhabited by something like 70,000; that these houses could not be made sanitary by alteration, and it became incumbent upon them as the local authority, if they valued the health of the community, to take immediate steps to remedy the condition of things. They went to Parliament and obtained an Act of their own, and under this Act they had effected a great improvement in the city. The necessity for the work being done was emphasised by the fact that in these areas they found that the death rate came out at about 60 per 1,000, and seldom less than 40 per 1,000. They had to feel their way carefully, for it was obvious they could not turn all the people out at once in order to rebuild the whole locality. That would mean the displacement of about 70,000 people, so they adopted the more feasible course of demolishing some 500 houses per annum. They did not, as they did in London, buy business premises for the purpose of re-housing and pay compensation unless some such premises stood very much in their way. They simply demolished the insanitary houses and then rebuilt. In some cases they sold some of the land to private builders. In ten years they had demolished about 4,200 houses, and there had been erected by private enterprise and by themselves over 800 houses. They were told that the houses erected by private enterprise did not meet the necessities of the case. The people who came and inhabited these houses were not the class of people unhoused, but were altogether a different class of people, and the houses they themselves built were also inhabited by a better class of the people than those who had been unhoused. As a result they found that except for having removed one class to make room for another, they had practically done nothing in the way of re-housing the people. It was recognised to be a serious question, and they applied themselves to it to see if something more could not be done. Under the guidance of their engineer they succeeded in producing a class of house which could be let at something like one shilling or one shilling and twopence per room. They built about 180 of these tenements, and they made it a rule only to accept as tenants those who had been dispossessed. It had been proved that 20,000 families in Liverpool had to exist on less than ten shillings a week, so that it would be seen that cheap rent was an important consideration. They had not proceeded under the 1890 Act, but had worked on their own lines, and up to the present time they had seen no reason to alter their decision. He thought they had solved a good deal of the problem of building suitable houses at a cheap rental. The Local Government Board at first said they could not pass the plans. The central authorities seemed to think that houses for poor people of this sort should be surrounded by grass plots and things of that kind. A deputation went from Liverpool to the Local Government Board, and having pointed out the local circumstances they induced the authorities to pass the plans. The dwellings had since been built, and although they were not exactly model dwellings, they were a great advance on what the people had enjoyed in the past. They had prepared plans for 200 more, and were really doing all they could to provide proper sanitary dwellings for the people.

Dr. J. J. **Weaver** (Southport), adverting to the statement of Alderman Purcell, said he should like to ask how these people behaved in the houses which had been built for them, Statements had been made that these people were not worth re-housing, and that it was difficult to induce them to observe anything like decency.

Alderman **Purcell** replied that the experiment in Liverpool had been entirely satisfactory. They found the people much improved in tone, and much more comfortable and happy in the enjoyment of the privileges that had been provided for them, and they paid their rent very regularly.

Dr. C. **Porter** (Stockport) asked whether Mr. Hair could give them any statement of the cost per bed of the new lodging house.

The President of the Conference (Alderman T. Walton) said he could perhaps answer that. The cost of the building was about


GROUND FLOOR
KITCHEN
STOVE
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DINING ROOM
STOVE
STOVE
SCULLERY
YARD
COALS
URINAL
W.C's
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3
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6
UP
ENTRANCE HALL
LOCKERS
COVERED WAY
OFFICE
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STORE
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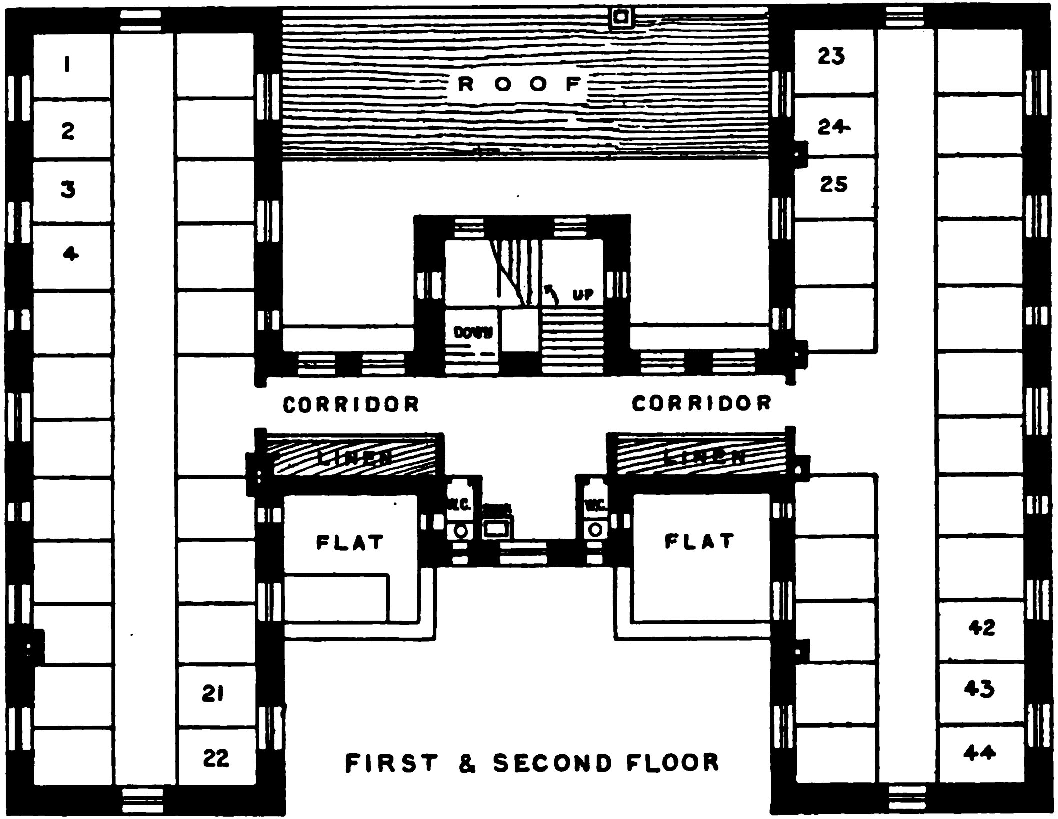
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W.C.
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FLAT
FIRST & SECOND FLOOR

£11,000, and the housing accommodation would be about 186 beds. They must remember, however, that in Southampton this lodging-house formed part of a big scheme of improvement, which included the making of new roads and other conveniences. The Corporation bought up a large area, of which the site of the lodging-house formed a part, and they paid £30,000 for between two and three acres. These were divided into three sections, and they had to complete one section before they could deal with the section No. 2. They were now completing No. 1, and providing for 186 in the new lodging-house and 148 in the artisans' dwellings. When they had done that they would proceed with the other area. It was difficult to arrive at the cost for one part as distinct from the whole. They must remember that Southampton was a very old town, and in counting the cost they must bear in mind the great improvement they were effecting generally.

Councillor **Welch** (Eastbourne) said he should like to learn what was the general opinion as to the introduction of private enterprise for the erection of artisan dwellings, and whether the adoption of this course was not preferable, as a rule, to municipal authorities taking the matter in hand. In his own town an artisans' dwellings' company had for some years paid five per cent. on dwellings they had erected. One reason why he thought that private enterprise was preferable was that the work could generally be done cheaper than by municipal authorities, with whom, in many cases, the expense was extremely problematical, as they often went in for experiments which might or might not succeed. With regard to ornamentation, he did not believe in any tawdry decoration. Whatever they might add in the way of decoration should be first-rate in character, or they should leave it severely alone. They did not want, however, much of that sort of thing in artisans dwellings, but plenty of room and air, and if the houses were well built they would, without doubt, bring in an adequate return on the outlay with proper management.

Councillor **Godbold** (West Ham) said that the remarks made by Alderman Purcell were extremely interesting, and he should like to know whether they had experienced any difficulty in acquiring the land. In West Ham they had passed a virtuous resolution to build five hundred houses. They were anxious to do that as they were suffering very much from a heavy rental throughout the district. Although the rates to-day were lower than they had been five years ago, within the last few months, rents in a few instances, had gone up quite three shillings per house per week. He should like to know whether the existence of these municipal buildings had any effect upon the rent charged on individuals by private owners, and whether there was any difficulty in obtaining land for work of this kind. If they built houses for workers it might have the effect of bringing down the rents generally.

Alderman **Bartlett** (Liverpool) said that their experience in Liverpool had been obtained under a private Act, and it did not empower them to buy compulsorily the freehold, but when the freehold was offered them they were very glad to take it. They found themselves in the position of having to provide houses for poor people of a class that the speculative builder could not provide for. The speculative builder as a rule had no capital. He borrowed money on mortgage. Most of it was Trust money and they could not expect trustees to lend their trust money upon such a small class of property as was required to house the poorer classes. The builders therefore could not build such property and so the Municipality had to build for themselves. Building for this class was an experiment that had answered in Liverpool very well so far. On the first year's return with this new class of building they obtained 4¼ per cent. The first year was not perhaps a fair test, but he thought they could see 4 per cent. in it. Mr. Blashill had stated that the houses should pay for the sinking fund on the amount borrowed as well as the interest. Altogether that would put a charge upon the houses of about 6 per cent., and they could not expect persons of this class to pay rents which would yield a net return of 6 per cent. The difference must come out of the rates. He did not see how they could help having some burden on the rates, if they were to deal with this question of rehousing in a thorough manner. They could not do this work effectually without putting their hands into their pockets.

Alderman PURCELL observed that most of the land upon which they built was the site of the insanitary area which they cleared, but where it was found necessary to buy land they had to pay through the nose for it.

Mr. T. BLASHILL (London) said that in London the practice was to put the interest and sinking fund upon the houses as well as the general expenses, but this was only for the purpose of seeing whether the houses could be built without involving a charge on the rates. The rents are estimated and are actually charged on the basis of rents usual in the neighbourhood.

Councillor G. MARLOW REED (Wood Green) said he understood a great deal of the difficulty with which they were confronted in connection with this housing problem would be overcome if the loans were extended to a period of one hundred years instead of sixty years. That was, he believed, a very good point. Another good point made was that they should not redeem the land at all. If they had new legislation which would enable them to borrow money for one hundred years, and that independent of the land, half the difficulty would be at once done away with, and it might do a great deal of good if the conference were to concentrate on that point. Their interest was not that of the private enterpriser, but that of the public health.

Councillor Dr. WILSON (Newcastle-upon-Tyne) said he hoped they would not go away with the impression that wherever there was a ieed for artisans' dwellings it was the duty of the municipality to rush n and build them. He hoped that they had not got rid of the rivate enterpriser, as he had been termed. He trusted the private nterpriser was alive and flourishing, and should be supported as gainst municipal competition. He re-echoed the sentiments exressed by Councillor Welch, that it was only in cases of great ecessity that the Corporation should step in. Mr. Godbold inimated that in building these dwellings they would be able to ompete with private enterprise, but there they at once came into irect conflict with honest trade.

Alderman **Hindmarsh** (Gateshead) asked in the event of their eing able to borrow for a hundred years would it not add greatly to he first cost of the houses. They would have to build very subtantial houses to last that time. He had been much interested n the paper, and the thanks of the Congress were due to the uthor, but the suggestion that they should borrow for a hundred ears passed his comprehension.

Councillor **Hollis** (Brighton) said they had just started artisans' wellings, and the difficulty they had to contend with was that of he attitude of the Local Government Board. It was very singular hat although they had land presented to them in two instances by nembers of the Corporation, for that very reason they were told hat they could not borrow money for more than thirty years. They ppealed again to the authorities and they consented to their borowing for forty years. That concession would make a difference of 1s. 3d. in the rent of each house, which was a great consideration. They would be able to let now at 7s. per house per week. Houses lose by of a similar character could be let at a shilling a week less, ecause the speculative builder was not bound down by the condiions imposed by the Local Government Board.

Alderman **Bartlett** (Liverpool) observed that it came as a great urprise to him that a municipality should consider it a duty to provide ouses for people who could pay a rent of seven shillings a week. They would be people earning thirty, forty, and perhaps fifty shillings week, and for a municipality to provide houses for such people eemed a monstrous thing. The requirements of people of that class ould very well be left to private enterprise.

"*The Annual Licensing of Common Lodging Houses and other points affecting their regulation,*" *by* CHARLES PORTER, M.D., D.P.H., Barrister-at-Law, Medical Officer of Health for Stockport.

ALL who are concerned in the work of sanitary administration are aware that common lodging houses frequently act as almost open channels for disease, especially small-pox, to enter and become spread through communities, and that the necessity for their supervision by the sanitary authority was recognized by statute as far back as 1847, in The Towns Improvement Clauses Act of that year, and shortly afterwards by the Lodging Houses Act of 1851 and 1853.

In large towns, especially where there is a considerable labouring population in more or less precarious employment, it is important and often very difficult to decide

WHAT IS A COMMON LODGING HOUSE?

Section 116 of the 1847 Act contained the following definition:—"Every house shall be deemed a public lodging house within the meaning of this Act, in which persons are harboured or lodged for hire for a single night, or for less than a week at one time, or any part of which is let for any term less than a week." In 1853 the Law Officers of the Crown advised that the term had references "to that class of lodging house in which persons of the poorer class are received for short periods, and *though strangers to one another are allowed to inhabit one common room*. . . ." By the words "strangers to one another," the Law Officers distinguished "lodgers promiscuously brought together," from "members of one family or household," and they further advised that "*the period of letting is unimportant in determining whether a lodging house comes under the Act* now in question." In their opinion, hotels, inns and lodgings, let to the upper and middle classes, were not referred to.

In the Public Health (Scotland) Act, 1867, a common lodging house is somewhat peculiarly defined "as a house or part thereof where lodgers are housed at an amount not exceeding fourpence per night for each person, whether the same be paid nightly or weekly, or at any period not longer than a fortnight, or where the house is licensed to lodge more than twelve persons."

The English Public Health Act, 1875, contains no definition of a common lodging house, but in a Memorandum dated the 25th July, 1877, the Local Government Board state that it may be inferred that the common lodging houses under the Public Health Act, 1875, come within the definition based upon "the habitation of a common room" by "lodgers who are strangers to one another in the sense of not being members of one family or household," and Section 87 of the Public Health Act, 1875, throws the burden of proof on the persons who allege that they are members of the same household.

The Local Government Board further remarks that the decision in Langdon *v.* Broadbent "points to the conclusion that in deciding whether a given house is or is not a common lodging house within the meaning of the Public Health Act, regard should in each case be had to the consideration whether the circumstances of its occupation are or are not such that supervision by the local authority will be necessary in order to secure the needed cleanliness, ventilation, good ordering, &c." There can probably be little doubt that this consideration was largely responsible for the recent decision that the admirable Rowton houses in London are not common lodging houses.

I think, however, all will be agreed as to the necessity for a recognised definition of a Common Lodging House.

GENERAL SANITARY REQUIREMENTS OF LODGING HOUSES.

The Public Health Act, 1875, as you are aware, provides that all common lodging houses shall be registered and shall be kept only by registered keepers.

Before a house can be so registered it "must have been inspected and approved for the purpose by some officer of the Local Authority," and the Local Government Board have officially laid down very definite rules for the guidance of the inspecting officers. The house should (1) possess the conditions of wholesomeness needed for dwelling-houses in general, and (2) it should have arrangements fitting it for its special purpose of receiving a certain number of lodgers.

The Board's requirements include dryness of foundations, proper drainage, guttering, and spouting, well-paved yards and areas, good walls, roofs and floors, efficient ventilation of rooms and staircases by opening windows, and a minimum allowance of 300 cubic feet air space per person, proper water supply, and adequate kitchen and day-room, washing and closet accommodation.

The points to which it is, on this occasion desired to draw attention are—(1) The necessity for *annual* registration; (2) for increasing the minimum allowance of air-space per sleeper; (3) the adequate provision of sanitary conveniences.

(1.) *The Necessity for Annual Registration.* — Under the existing general law, the rule is "once a registered lodging-house, always a registered lodging-house," unless the licensee has, *as such*, been three times convicted of an offence against the Public Health Act, or unless the Health Officer can obtain closure by certifying, under the Housing of the Working Classes Act, 1890, that the house is unfit for human habitation. Now, quite obviously, a house which is not unfit for human habitation may be quite unfit for a common lodging-house, and one reason why Parliament was successfully asked in Section 101 of the Stockport Corporation Bill, 1899, for power to require annual registration of these houses, is in order to be able to deal eventually with the unsuitable places at present registered. It is believed that such a requirement will in addition, (1) conduce to the better condition and ordering of all the registered houses in the Borough, by making them annually toe the line of sanitary decency, and, as the registered accommodation in Stockport is wholly insufficient, it will enable the Corporation to license *temporarily* some of the least objectionable of the numerous unregistered places which are structurally unworthy of permanent registration. These places will thus be brought under regular sanitary supervision until, by municipal or private enterprise, sufficient suitable registered accommodation is provided.

When the Stockport Bill came before the Police and Sanitary Committee in London, this annual registration clause was strongly opposed by the Local Government Board, on the ground that it would involve forfeiture of vested rights, &c. In reply, it was urged that the premises of knackers, game dealers, licensed victuallers, music-hall and theatre owners are subjected to yearly revision of their license, and under the Public Health (Acts) Amendment Act, 1890, sec. 29, sanitary authorities possess the power of limiting to twelve months the license for any new slaughter-house. Further, under sec. 20 of The Public Health (London) Act, 1891, licences for all cow-houses and slaughter-houses in the Metropolis expire on such day in each year as the County Council fix, and the renewal of any such license may be refused by the Council. It, therefore, seems somewhat anomalous that common lodging-house licenses should enjoy this remarkable exemption from annual revision.

It was also pointed out that Burgh Police (Scotland) Act, 1892, sec. 284, confers on municipalities the power to require the closure *without compensation*, of all private slaughter-houses, after a period of grace of three years from the public announcement that the use of private slaughter-houses is obligatory. One has never heard that over the Border vested rights are less respected than in this country, and if Parliament authorizes the closure of even *good* slaughter-houses in Scotland after three years' notice, obviously it is no hardship that *bad* common lodging-houses in England should be treated in a similar manner, especially as the displaced keepers will have no difficulty in getting new licenses if they like to provide suitable lodging-houses. Surely, it cannot seriously be maintained that persons who make their living in this way have a vested right to fatten upon the discomfort and unhealthy surroundings of the poor creatures who are forced to live in such houses.

In the result, as already stated, Parliament allowed the section, being the first time this power has been granted to a Sanitary Authority.

(2.) *Allowance of Air-space per Sleeper.*—In former years, 250 cubic ft. was regarded as a reasonable allowance, but from recent inquiry in most of the large towns it appeared that 300 cubic ft. is at present the usual allowance, and this is the figure suggested in the Local Government Board's memorandum of July, 1877. This standard has, however, been determined more with a view to difficulties of lodgment in large towns, and the minimum of space that can be occupied by a sleeper and his bed, than with any regard to physiological requirements, and when it is remembered that in a room of 1,000 cubic ft. occupied by one man, the air must be changed three times per hour in order to keep it within the so-called "permissible limit of respiratory impurity," it will not be unreasonable to ask for a minimum allowance of 400 cubic ft. per sleeper, especially by any who have visited such sleeping rooms in the small hours. This standard has been voluntarily adopted in many of the most financially successful modern lodging houses, and in Stockport, the Sanitary Committee have decided to insist upon it. In addition, attention should of course be paid to the existence and efficiency of methods of ventilation in each case.

(3.) *Provision of Adequate Sanitary Conveniences.*—Section 87, of the Stockport Act of 1899, empowers the Corporation, on the report of their Medical Officer of Health, or Surveyor, to require the provision of sufficient and suitable Sanitary Conveniences, and as in factories and workshops with proper separate accommodation for the sexes. Having regard to the existing conditions in these respects in the average common lodging house, there can be no question as to the importance of these provisions. In connection with common lodging houses, I have found that slop-water closets are specially suitable, as a very large amount of water is daily used by the lodgers (in one house of 120 beds it was nearly 600 gallons a day), and the deputy is always on the spot to see that they are kept in a clean and efficient condition. For every twenty lodgers the keeper is required to provide one water-closet.

In conclusion, expression of opinion is invited as to the necessity for annual licensing of *all* common lodging-houses, and as to the possibility of the insertion of a clause to this effect in the next Public Health Acts Amendment Bill. The writer would also be glad of information from the representatives of towns possessing municipal common lodging-houses as to their general and financial success or otherwise.

STOCKPORT CORPORATION ACT, 1899.

SECTION 87.—(1) Every common lodging house shall be provided with sufficient and suitable accommodation in the way of sanitary conveniences, having regard to the number of lodgers who may be received therein, and also with proper separate accommodation for persons of each sex.

(2) Where it appears to the Corporation on the report of their medical officer of health or surveyor that the provisions of this section are not complied with in the case of any common lodging house, the Corporation may, if they think fit, by written notice, require the keeper thereof to make such alterations and additions therein as may be required to give such sufficient suitable and proper accommodation as aforesaid.

(3) Any person who neglects or refuses to comply with any such notice shall be liable for each default to a penalty not exceeding twenty pounds and to a daily penalty not exceeding forty shillings.

SECTION 88.—*Application for the renewal of the registration of every common lodging house shall be made to the Corporation at or previous to the fifteenth day of May in every year*, and the Corporation, notwithstanding the provisions of section 78 of the Public Health Act, 1875, may refuse to register any house which they do not consider suitable for the purposes of a common lodging house, and any person as the keeper of a common lodging house who does not produce to the Corporation a certificate of character in such form as the Corporation shall direct, but notwithstanding such certificate of character the Corporation may, if they see fit, make further enquiry, and may thereafter refuse to register if they are satisfied that the person applying is not qualified to be the keeper of a common lodging house. Any person aggrieved by such refusal may appeal to a Petty Sessional Court held for the Borough after the expiration of two clear days from such refusal, provided he give twenty-four hours' notice of such appeal and the grounds thereof to the town clerk, and the Court shall have power to make such order as they may think fit and award costs, such costs to be recoverable in like manner as a penalty under this Act.

Dr. PORTER moved the following resolution: "That in the opinion of this Conference the licenses of all common lodging-houses should be subject to yearly revision."

Dr. SNELL seconded, and it was carried unanimously.

"*On the bearing of Section 17., subsection 1., of the Public Health Acts Amendment Act, upon the discharge of brewers' refuse into the sewers of Local Authorities*," *by* JAMES BRIERLEY, Borough Analyst, Southampton.

THE above section provides for a penalty, not exceeding five pounds per day, upon every person who turns, or permits to enter into any sewer of a local authority :—

(*a*) Any chemical refuse or

(*b*) Any heated water or liquid of a higher temperature than 110° F., which either alone, or in combination with sewage, causes a nuisance, or is dangerous or injurious to health.

A discussion as to the meaning of the term "Chemical refuse" will, no doubt, be of considerable interest to many authorities represented at this congress, in view of the fact that local authorities are being severely pressed as to the purity of the effluents from sewage disposal works discharged by such authorities into fresh water streams and rivers.

More especially those authorities who have to deal with sewage containing a large proportion of "brewers' waste."

Brewers' refuse is more frequently turned into sewers than waste from any other source.

The character of this refuse renders it quite as difficult to deal with, if not more so, than the waste from any other trade. Being highly nitrogenous, frequently of a high temperature, or in a state of active fermentation, sometimes strongly acid and putrefying readily when exposed, it is rightly objected to in sewage by those who have to deal with such sewage.

It will be noticed that the section simply says "chemical refuse," thus leaving the parties concerned to settle by arrangement what shall be considered chemical refuse, or to ascertain by appeal to the Judges what is the meaning of the term. This is a costly legal proceeding.

What, then, is "chemical refuse?" There is no definition of this term. Refuse is defined as that which is refused or rejected, also as waste matter. The word chemical is defined as —(1) pertaining to chemistry; (2) resulting from the operation of the principles of bodies by combination, decomposition, &c.; (3) according to the principles of chemistry.

"Chemical refuse," therefore, may be defined as refuse or waste pertaining to anything chemical, or resulting from the action of the principles of bodies to produce combinations, or decomposition, &c., in such bodies, in accordance with the principles of chemistry.

Does brewing consist of processes coming within the meaning of the above definition ?

The three principal stages of brewing are—

1. Mashing.
2. Hopping, or boiling the wort with hops.
3. Fermentation.

1. Mashing is the process of infusion to which the malt, or malt and grain, are subjected.

The malt, &c., is placed in a large vessel, or mash tun, and agitated with water at a certain temperature and allowed to infuse. The water dissolves out certain principles or substances from the malt and grain, as starch, maltose, diastase, proteids, &c. The diastase is a chemical ferment, which sets up combination and decomposition, resulting in the breaking down of the starch molecules into less complex bodies, known as maltose and dextrins.

Hopping.

After infusion has been effected, the liquid drained from the "mash" is boiled with hops. Sometimes with other materials in addition.

In this process further chemical changes are produced by means of the lupulin of the hops and the effect of heat upon the nitrogenous bodies known as proteids. Some proteids being rendered insoluble, and others changed in character, are rendered more suitable for the action of the yeast in the process of fermentation.

Fermentation.

This is probably the most important stage in brewing and is generally regarded as being chemico-biological.

Research has shown that the yeast plant contains within itself a chemical ferment resembling diastase which has the power of changing maltose into alcohol and carbon-dioxide.

The plant itself being a living organism requiring carbon, oxygen, nitrogen, etc., for its growth, is believed to attack the maltose and other principles of the wort, taking away from them the constituent elements it requires as food. In this way it breaks up their molecules, producing chemical changes resulting in the formation of alcohol, carbon dioxide, and small quantities of glycerol and succinic acid, and lessening the quantity of nitrogenous matter present in the finished beer.

The refuse, or rejected portions from the above processes, together with the washings of the vessels and empty barrels, barrel-bottoms, ullage, etc., forms brewers' refuse.

The whole process, or series of processes, from the raw materials to the finished article is seen, from the above description, to consist of a series of chemical changes, and the refuse which is obtained results from the operations of the principles of the bodies used producing decompositions, combinations, etc., and therefore such refuse is clearly "chemical refuse."

This refuse is frequently ten times the strength of the worst sewage, whether measured by the quantity of nitrogen it contains, or by the oxygen it absorbs.

Further, it is frequently at a temperature above 110° Fahr. when turned into the sewers.

My own experience of this refuse is that alone or mixed with sewage it is a serious nuisance. It putrifies, giving off noxious gases.

An important consideration in connection with the admission of chemical refuse to sewers, is the quantity admitted relatively to the bulk of the ordinary sewage of a district.

For example, where the volume of sewage is three or four million gallons per day, the admission of 80,000 gallons of "brewers' refuse" is not very serious. But where the sewage is only 80,000 gallons per day, the addition of an equal quantity of refuse is a positive nuisance, and the increased cost of dealing with it becomes a real hardship to the ratepayers. This is not an imaginary case, such a condition of things actually exists, and the hardship is increased by the fact that the sewage has to be pumped a distance of half-a-mile to a considerable height for subsequent treatment.

In another case a Local Authority refused permission to the owners of breweries to turn their refuse into the sewers. In defiance of this refusal a nine-inch drain was broken into, and the refuse is being turned into the sewers. The Authority must submit or enter into expensive litigation with a wealthy opponent.

However, there are *brewers* and brewers. I know of a large brewery where the refuse is chemically treated before discharge.

Where high-handed proceedings, such as the above-mentioned, are taken by firms, and the quantity and character of the refuse turned into the sewers are a costly nuisance, the absence of clear definitions of the terms used in Acts of Parliament is a great hardship.

In conclusion I would suggest:—

(1) That it is desirable that Local Authorities should try to obtain the addition to the Public Health Acts of a table of definitions of such terms as "House refuse," "Trade refuse," "Chemical refuse," etc.

(2) That where it is only possible to obtain the legal meaning

of a clause, or terms in a clause of such Acts, by the trouble and expense of legal proceedings, Local Authorities shall be permitted to join in the cost of promoting test cases in order to obtain definite decisions as to the matters in dispute.

Mr. G. THUDICHUM (London) said he could not agree with the author when he stated that this waste was so difficult of treatment that it should be excluded from the sewer. He had recently been advising a local authority in Surrey with regard to the treatment of a sewage which was almost identical with that suggested by the reader of the paper, namely, 80,000 gallons total sewage, of which 25,000 are brewers' refuse, and he had succeeded by a simple biological process in absolutely purifying the whole of the brewers' waste. Further, they had purified burnt ale, which was the most obdurate of the materials they had to deal with. They only employed simple biological methods which were unpatented, and they were so successful that they obtained salmon ova in the effluent. With these means at the disposal of local authorities he did not see why they should interfere with and handicap manufacturers and make them treat their own sewage.

Alderman GIBBONS (Wolverhampton) said he quite agreed with the reader of the paper, that there should be special treatment for brewers' refuse. Many manufacturers who lived from hand to mouth had to submit to the expense of special treatment for their trade refuse and he did not see why brewers who were the most prosperous class in the country should not do the same thing. In large towns where the outfall was large and they had not many brewers it did not much matter, but in towns like Lichfield for instance, where the outfall was not very great and they had two big breweries it became a very important matter for the local authorities. While these big breweries were earning large dividends, the ratepayers were mulct in the cost of purifying their refuse. He thought the breweries should be compelled to treat their sewage in some way before they turned it into public sewers.

Councillor A. UPSON (Maidenhead) said this subject was of great importance to the town which he represented, and they would be greatly interested to know whether the biological treatment of sewage would be interfered with by brewers' waste. They were told that it had been found in practice that brewers' waste did not interfere with proper working of the biological system. He should like to obtain further information as to how the waste was dealt with, and whether it did not depend in a great measure on the method of disposal. The statements which had already been made during that debate, statements evidently the results of recent practical working of bacterial methods, showed the great value of such an Association as The Sanitary Institute.

Councillor A. S. CAMPKIN (Cambridge) asked Mr. Thudichum if Brewery Waste could be treated biologically as effectually as the ordinary domestic sewage. He believed it was not possible to apply the same in localities where there was a large amount of refuse from dye works, as that destroyed bacterial action. In some of the country districts where the sewage was of a domestic character biological treatment had been most effectual; but where there was a large quantity of brewery waste the sewage was decidedly acid, and was differently treated. While in some of the manufacturing towns chemicals had been largely used, therefore what applied to one would not necessarily be effectual in another case. In places where sewage was largely composed of brewery waste in combination with that of a domestic character, it would cause great inconvenience and expense to have two separate systems of treatment.

Mr. J. BOLTON (Heywood) said he agreed with the author of the paper. They had large quantities of brewers' refuse and other refuse turned into their sewers, and experiments on the biological system proved that they could not successfully treat such sewage as they had to deal with—or at any rate it was very difficult to do so without a large area of beds, the cost of which he considered it was unfair the ratepayers should be asked to incur.

Mr. THUDICHUM remarked that there was no shadow of a doubt that ordinary brewers' waste mixed with domestic sewage could be successfully treated. and that without additional expense to the ratepayers. It had been done, and could be done again anywhere and at any time. The question as to mixed sewage which contained refuse from dye works and such places was quite another matter. He did not maintain that any sewage could be treated in the way suggested. It must contain organic matter, but each case would have to be considered on its merits and dealt with according to the local circumstances that prevailed. Some time back there was a case in the North of Scotland where a distiller on a large scale brought an action against the local authority to compel them to take his refuse into their sewers. The authority said it would destroy the sewer and also prejudicially affect the disposal of the sewage. He was called in to give evidence as to the biological treatment of burnt ale and other refuse. He produced in the witness box the effluent obtained, and the case was given against the local authority. The main ground for the decision given was that the court was absolutely convinced that the refuse could be biologically treated.

Councillor R. E. W. BERRINGTON (Wolverhampton) pointed out that an important aspect of the question was in respect to the difficulty of dealing with the sewage at the outfall. There was no difficulty in treating the sewage at all. It was only a question of cost. He agreed largely with what Mr. Thudichum had said. The author had, however, brought out several important points in connection with the subject which merited consideration.

Mr. J. E. **Willcox** (Birmingham) said the case of a brewery in Somersetshire had been mentioned where they treated their own refuse. He understood, however, that the brewery in question had no option but to do as they had done. He also instanced other places where they treated their own sewage in the same way.

Mr. J. **Brierley** (Southampton) in reply said that he should think brewers' trade refuse was a material which would lend itself particularly to bacteriological treatment, but he would point out that where they had a quantity of brewers' refuse equal to the sewage to deal with they would have to erect double the plant at double the cost. He did not see why a local authority should be put to that expense, or why they should be asked to treat brewers' trade refuse any more than they did the refuse of other trades. Trade refuse was not removed as a rule unless a special payment was made for it, and the same principle should be applied in the case of brewers' waste. He further commented on the necessity for definitions of trade refuse and powers for local authorities to combine in fighting disputed cases affecting more than one authority, and finally pointed out that Parliament made statutes but the judges by their interpretations made the law.

"*The Establishment of Joint Committees for Watershed Areas,*" *by* MAJOR LAMOROCK FLOWER, F.R.Met.Soc., Sanitary Engineer Lee Conservancy Board.

(FELLOW.)

It is not the intention of the author to propose the creation of any new public body, but rather to raise the question as to how the existing authorities may be utilised in amelioration of the polluted state of our rivers, a condition which has not inaptly been styled "*a national evil.*"

It has been said that good ideas are not born singly, and the advocates for adopting the catchment area of a river at the watershed line as the boundary of administrative jurisdiction are many.

In this direction the author made a suggestion at the Conference on the Health and Sewage of Towns, which was called by the Society of Arts at the instance of H.R.H. the Prince of Wales in May, 1876, in these words: "*If we are to have our rivers purified, the whole country should be mapped out into districts, each under a competent Sanitary Officer, who should have large powers, under Conservancy Boards formed to legalise his acts.*"*

As President of the Conference on River Pollution held by e Sanitary Institute at the Congress at Leeds in 1897, he ought forward the idea again, and entered into many details, hich are to be found in the Transactions of the Institute as cords of the Leeds Congress.

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* *The Journal of The Sanitary Institute*, Vol. XVIII., Part III., p. 318.

The suggestion was amply dealt with at the Sessional meeting the Institute on 4th March, 1898, by Dr. Christopher Childs, his admirable paper on "*Water-borne typhoid fever*," his ntention was that each watershed should have its authority, d that it would be well in view of water-supply, that authori- es should purchase the watershed from which the water is awn, and quoted Torquay as a notable example.

It was thought that the establishment of County Councils ould provide the necessary authority, but it has been found at County Councils have plenty of work to do in other irections, and that without some definite centralized power to ntrol action, river pollution is likely to go on practically nchecked.

It is true that we have the Local Government Board, but e department is already overworked.

Dr. Childs takes as a precedent the Lee Conservancy Board, hich he quoted as "an excellent model and an object lesson the whole nation."

The Lee Conservators are the first public body entrusted ith the care of a whole watershed area. It seems almost nnecessary to repeat that the author is the first officer in the ingdom, to whom was entrusted the duty.

His experience from 1871, as to the value of individual ction was the key-note of his suggestion in 1876. He has no eason in 1899 to change his opinion, the difficulty appears to e to induce existing authorities to combine together for the ublic good.

Mr. R. E. Middleton drew attention to this in his paper on *The desirability of making watershed areas and sanitary districts oterminous*" at the Sessional meeting of the Institute, on the th April, 1898.

He said: "Every authority is in conflict with its neighbour, —conflict in interest, if not in fact—and litigation and dis- greement are too frequently the result."

The author thinks that such an eminently unsatisfactory tate of affairs ought not to exist.

Dr. Childs puts it, "Individual action is the key-note of the ork". It appears to the author that the appointment of a pecial officer to the charge of each watershed which is contained n the jurisdiction of several County Councils, with reference o a joint committee consisting of members out of each council ould solve the difficulty.

We find that *The Times*, 6th Aug. 1884, writing on the subject of Pollution of Water Supplies, supports the author's ideas: "*The matter should be dealt with as a whole, and by an authority armed with larger powers than those which the conservators possess, not necessarily a dictator.*" "*An officer with ample powers, acting under the authority of the Local Government Board, who should legalise his acts, and who ought to instruct all the officials and authorities under any Act of Parliament affecting the public health to afford him every assistance.*"

There were no county councils in 1884; and the Lee has not stood alone since 1892, when the "Mersey and Irwell Act" was passed.

In 1894, too, the Thames Conservators' jurisdiction was extended to the whole watershed area, with undeniably good results. At the beginning of 1898 as many as seventy-eight towns or villages, with an aggregate population of over 180,000, polluted the river or its tributaries. We find that Mr. Groves, the analyst to the Conservators, reports that, owing to the action taken by them, the amount of organic impurity in the water immediately above the company's intakes is now only about two-thirds of what it was before the passing of the Act of 1894.

In the Thames watershed—to quote from Mr. Middleton's paper—are fifteen counties and over 2,000 different authorities.

It is not to be supposed that results such as I have quoted could be brought about without some "heart-burnings," but the facts remain.

The river Severn flows through twelve counties, and has some 1,200 different authorities.

The Thames, which is managed by a committee out of the whole body of Conservators, seems to point a model for imitation in that sense of the word.

"The history of the Lee Conservancy Board"—again to quote Dr. Childs—"gives plenty of examples which illustrate the fact that individual diplomacy and tact may triumph, where threats of the law or the manifestoes of a committee would certainly fail."

One of the chief objects of Sir Francis Powell's "Rivers Pollution Bill," is the promotion of Conjoint Councillors and Rivers Boards deputed by local authorites to take under control the streams, rivers, &c., within their respective watershed areas.

In dealing with the question of watershed areas the author desires distinctly to point out that he refers solely to jurisdiction over pollution of rivers; it is too late now to alter the time honoured county and parish boundaries, there are also

any points on which he might touch, as to flooded areas,
illers' rights, and kindred subjects; he thinks, however, that
ough has been said by way of an introduction to a discussion
om which he trusts some resolution may arise for transmission
the Council in view of bringing about a practical result.

Councillor Dr. **Wilson** (Newcastle-on-Tyne) observed that during
last Session of Parliament Newcastle asked for a bill in which
ey desired to insert a clause which would enable their medical
ficer to examine the gathering ground for the water supply. They
ought that it would be a good thing for the public if they obtained
e necessary power to do this. He was sorry to say, however, that
e Local Government Board, after being appealed to by the Water
ompany, struck the clause out. He hoped, therefore, that Major
lower would still persevere, and that the Congress would now pass
resolution with a view to strengthening the position that they were
sirous of taking in the matter.

Dr. E. **Sergeant** (Lancashire C.C.) said that he had pleasure in sup-
rting the views expressed by Dr. M'Clean Wilson that public
dies should have the power to inspect watershed areas. The
ssion before last, his county council opposed bills because they
anted the insertion of similar clauses in them. They showed
fficient reason for their request, for on examining certain gathering
ounds they found them contaminated in a very serious manner.
report that he made on the subject was corroborated by a second
port from an independent source. The matter was reported to the
ouse of Lords and by them referred to the Local Government
oard. The Local Government Board reported against them and
ey did not get the power asked for. It was a great pity that they
ould have taken that view of the question. They said they had no
jection to medical officers of small authorities making examina-
ons. They knew that small bodies could not make Water Boards
ove in the same way as the County Council could. In view of the
portance of the subject, he should be glad to support any action
ken in the matter. There were proper authorities to deal with the
llution of rivers, and it was surely as necessary to have properly
pointed authorities to see that every precaution was taken to
sure the purity of water that was drunk, by a systematic examina-
on of and control over the gathering grounds. It would be better
rhaps to appoint such an authority which would be distinct from
y existing water authority.

Alderman T. **Wetherell** (Northampton) recommended that the
ongress should support some definite resolution dealing with the
bject. In many boroughs the water supply was contaminated, and
e nuisance was often found to arise in consequence of the

carelessness of the central authorities. He had occasion to visit the source of a certain water supply and discovered that (perhaps more from ignorance than anything else), sewage was allowed to flow into the streams. They approached the County Council who said they could not hear any persons who were not an immediate Authority. In one case he could refer to they had to deal with an Oxford College authority; this was eighteen months since and as yet nothing had been done. It was in his opinion highly necessary that action should be taken, for there could not be any proper remedy until they had the right to visit the catchment areas and see that the sources of supply were not contaminated.

Mr. **Joseph King** (Surrey C.C.) said that the Surrey County Council found that it could not really deal with river pollution unless their powers were increased. At present such long notices and delays were necessary, that a scandalous pollution could not be remedied in six months. He instanced parishes, summoned by the Thames Conservancy for pollution, and fined each £50, which fines were paid by the whole sanitary district, and came cheaper to the parish than preventing the evil by a costly drainage scheme. That sort of thing showed the need for increased powers. But if larger powers were given to protect the different watersheds, he hoped that all interests would be fairly represented. At present in Surrey they were suffering from the sudden and large demands of the Thames Conservancy, made in the interests of the London water supply; if those demands had been made long ago, or less stringently all at once, the great expense and sense of injustice felt by many would have been avoided. Generally, however, he approved of the proposal contained in the paper that had been read.

Major **Lamorock Flower** (London), replying on the discussion, said he was glad to know that the points he had advocated seemed to meet with general approval. He knew how difficult it was to get local authorities to combine to carry out public improvements.

The **Chairman** moved the following resolution: "That in the opinion of this meeting the desirability of establishing a joint committee for watershed areas is necessary, and they recommend the Council of the Sanitary Institute to further the object proposed in Major Flower's paper by action in the proper quarter."

Mr. **Wetherell** seconded.

Dr. **Sergeant** (Lancashire C.C.) remarked that in many districts the proposition would be of great value, but in Lancashire he was afraid the difficulties would be overwhelming.

The proposition was carried unanimously.

"*Smoke Abatement*," *by* E. A. BRAYLEY HODGETTS. (MEMBER.)

ABSTRACT.

HE position with regard to smoke abatement is simply this: at smoke is a preveventible nuisance, a danger to health, a tional waste, and that it should therefore be prohibited. ur opponents will doubtless admit our premises, though they ill probably add that the danger to health of smoke is very uch exaggerated, but they will meet our contention that noke should be prohibited with a surprise *non possumus*.

Before we attempt to refute them, let us take a broad view the smoke question, and ask ourselves what it really means.

Our planet depends for its life upon the sun, which is so viously the source of this world's energies that in ancient mes human beings used to worship it as an outward and visible anifestation of the deity. It has been reserved for so-called vilised peoples to produce artificially and at great cost, clouds mposed of sulphurous vapours and small particles of carbon hide the sun from them, and cover the places where they live ith a pall which keeps out the light, arrests vegetation, and terferes with the functions of the respiratory organs.

This is on the face of it absurd.

In the early part of this century we may be said to have ddenly discovered the laws of sanitation. We became alive the fact that it was dangerous to health to keep festering trid excreta and refuse in the immediate vicinity of our bitations, because we understood that the emanations from ch excreta and refuse might pollute the air we breathed and reed pestilential diseases. We therefore invented the water-rriage system, and at great expense executed extensive works r carrying away and disposing of our sewage as rapidly as we ssibly could.

We next discovered that pure water was one of the first ecessities of life, and so we framed laws to make the pollution our rivers and streams a punishable offence.

But we did not give a thought to the far more dangerous tificial pollution of the air by coal smoke. That is still treated rgely as a sentimental question, an art question, and an onomic question.

Nevertheless it is obvious that the artificial pollution of the r by coal smoke must be more dangerous to the public health an the natural pollution of the air by emanations from excreta the natural pollution of water, however dangerous these tter no doubt are. For the pollutions referred to can at ost but breed epidemics which will carry off the weaklings, but the wholesale poisoning of the air by coal products, and the consequent obscuration of the sun and absorption of oxygen, is a direct danger to every individual, and if permitted to go far enough would doubtless result in the final extinction of the human race.

Peoples have managed to exist, even in densely populated cities, for hundreds and perhaps thousands of years without any system of so-called sanitation, as we understand it. But there is no record of smoke-producing towns keeping up a natural increase of population. We all know what is going on in our own towns. Town-bred families become extinct after the third generation; the extraordinary growth of our urban populations is increasing at the expense of the country, which is being rapidly denuded. But what is far more alarming still is the statement recently made by the Registrar-General to the effect that a decline has already set in at the rate of increase of the population.

We have glanced at the question from the national and the scientific points of view; I now propose to look at its legal aspect. It is very much the fashion to grumble at the law of the land with regard to smoke; but, as everybody knows, laws were made to be evaded. The law may be as stringent as you please, as stringent as it is stated to have been in the days of King John, but unless public opinion is educated up to a true understanding of the heinousness of any crime, there will always be the very greatest difficulty in enforcing the law. For instance, Dr. Sedgwick Saunders, Medical Officer of Health for the City of London, states in his last issued annual report, that, as far as the City of London is concerned, the law relating to the smoke nuisance may be regarded as a dead letter. It is certainly not very long ago since there was a general and pretty well justified impression abroad that certain London police magistrates would refuse to convict any person charged with causing a smoke nuisance. There were supposed to be certain vestries in London who ignored the whole question, and refused to take any notice of complaints of smoke nuisances, vide Sir William B. Richmond, *passim*. If the Coal Smoke Abatement Society has done nothing else (it has really done a great deal besides), it has at least altered this former attitude of the vestries and police magistrates of London, as any casual glance at a London morning paper will show. The Coal Smoke Abatement Society has stimulated public opinion. Nevertheless, much remains to be done from the purely legal point of view. At the present day the law is unjust. We Englishmen pride ourselves on having the same law for the rich and for the poor alike, but with respect to the smoke nuisance the law of he land presses heavily on the rich man and entirely spares he poor man, who is very often the worst offender. This is ot only an injustice, but entails two evil consequences. The ich man is better able to avoid and bear the penalties which he law inflicts, and hence is not deterred from committing the ffence, and public opinion, knowing the poor man to be the worst offender, feels the injustice of penalizing only one class f criminals, and hence a general impression is created that the whole question is purely sentimental, or, worse still, faddist, nd that it is not deserving of serious attention. Why manuacturers should be punished for polluting the atmosphere while householders are allowed to go free, it is difficult to understand.

But the question which we should consider is not whether he householder or the manufacturer is the greatest offender. We have to ask ourselves whether the pollution of the air of owns by means of coal smoke is injurious to health, and, having answered that question conclusively in the affirmative, t then becomes our duty as a nation to put a stop to such pollution by all legitimate means. The statesman must regard ll acts injurious to society as a whole, or to individual members of society separately, as crimes. The pollution of the air with coal smoke is injurious to society as a whole and to individuals separately, hence it is a crime, and should therefore be punished n order to deter people from committing it.

Before taking leave of this aspect of the question I should ike to point out that the law already interferes with house drainage questions, and prohibits the pollution of rivers, hence the prohibition and prevention of air pollution by coal smoke is only another step in a general advance in sanitation.

In the United States of America and in Canada, which are vast tracts of country inhabited principally by descendants of the British races, a further step in the evolution of domestic heating has been taken. In England we still cling to our old barbarous and prehistoric methods; on the continent stoves have replaced fire-places, but in North America the stove has been replaced by circulating systems, that is to say, houses are heated from a central station, the steam or hot water, or hot air, is conveyed in pipes, and laid on to the houses, just as gas and water are laid on. Regulator valves allow the householder to lower or raise the temperature of his house as he wishes, just as we can regulate the flow of water into a bath by turning the tap. The population of America cannot be described as unhealthy.

This, in my opinion, is the most civilized mode of heating yet attained, and less injurious to health than gas. By having a central station you centralize your smoke producer, and are able to watch and check it. Of course we may attain to greater perfection yet, and do all our domestic work by electricity, but that day still seems to be very far off, that future is indeed "dim and distant."

While the domestic smoke problem is mainly caused by a superstitious reverence for an exploded institution, and could be easily solved if heat were supplied from a central station, the industrial smoke problem resolves itself practically into a question of stoking. With good stoking, good draught, and normal working, there need be no appreciable smoke production.

In conclusion, I wish to call your attention to the question of recording and checking smoke. Smoke has been divided into ten classes, into three classes, and again into five classes, or degrees, of blackness. A great deal of trouble and confusion has been caused by these classifications, which have arisen largely out of the circumstances that the law distinctly specifies black smoke as being subject to penalty. In my humble opinion I think this is a quibble, and agree with Mr. Dee when he says that all these diagrams and classifications are misleading. The magistrates who administer the law of this country cannot be expected to go into the niceties of distinction between "very dark grey smoke," "black smoke," and "very black smoke." Smoke is smoke, and provided you can get people to give evidence that "black smoke," whether "very dark grey" or "very black," has been emitted for any consecutive period, the perpetrator of the nuisance should be fined. The present Act is admittedly unsatisfactory, because it opens the door to a great deal of quibbling, such as whether reasonable care had been taken, &c. There can be no question that what is wanted is a short Smoke Abatement Act, to be applicable not only to London, but the whole of the kingdom. The present inequality of the law should be abolished, and the private individual should be made to abate his own smoke as well as the manufacturer. The latter, being the more voluminous offender, should of course be subjected to a heavy fine. Many difficulties would present themselves, and no doubt many Royal Commissions would have to sit and hold inquiries, and publish voluminous reports, before any change in the present state of the law could be effected. In the meantime it should be the duty of all sanitarians to keep educating the public in the dangers of air pollution. The Coal Smoke Abatement Society is not yet a year old, but it has already produced a marvellous change over the face of the London sky. We have woke up our vestries, we have awakened our magistrates to a due sense of their duty in this question, we have awakened the Press of this country, and we have delivered popular lectures, notably ne by the Hon. Rollo Russell; an exhibition of smoke-preenting appliances has been held under our auspices; and we ave stirred up public opinion. Having put our hands to the lough, we do not intend to look back or to rest in our efforts ntil we have brought about an appreciable difference in the tmosphere of London, and that will, I fear, take some coniderable time.

Councillor A. **Park**, J.P. (Ashton-under-Lyne), said he was a nagistrate for Lancashire, and for eight or ten years in his division hey had not had a conviction for the emission of black smoke. They had an inspector whose duty it was to take observations in egard to smoke, but it was extremely difficult to administer the Act n a purely manufacturing centre.

Dr. **Sergeant** (Lancashire C. C.) said that he agreed with a great leal said by the reader of the paper, but he did not agree with him hat towns were de-populated because of the presence of smoke. The prevention of smoke was not altogether a question of stoking. The nuisance could be mitigated by good stoking, but it was not a remedy. He mentioned two instances where the adoption of certain mechanical ontrivances which he described, effectually did away with the nuisance which existed in one particular district.

CONGRESS AT SOUTHAMPTON

(*Continued*).

CONFERENCE OF MEDICAL OFFICERS OF HEALTH.

THE proceedings of the Conference commenced with an address by the President, T. ORME DUDFIELD, M.D., M.R.C.S., L.R.C.P., which was published in the Journal, Part III., Vol. XX.

"*Bacteriology in relation to Public Health Administration*," *by* A. K. CHALMERS, M.D., D.P.H., M.O.H., Glasgow.

HAD it not been for the urgent solicitations of your Secretary I scarcely think that I should have ventured to trespass on your time with a few commonplace observations on the administrative value of bacteriological enquiry, but I was the more readily led to acquiesce in Dr. Priestley's suggestion for the reason that of late there has been almost constantly present to my own mind the question to what extent and in what direction bacteriology can be enlisted in the service of public health administration. If we attempt to answer the first part of the question there need arise no suggestion of imposing artificial limitations to the scope of the aid which bacteriology may render if we place its assistance precisely on the same plane with that supplied by the laryngoscope and opthalmoscope in other fields of medicine. That is, in the recognition of disease it takes rank as an additional clinical aid to diagnosis, and not as an invariable test by which other evidences are to be accepted or rejected. In other words, we must adjust its value on the basis of clinical inference. This point need not be elaborated. All of us have seen cases where Widal's serum test yielded inconclusive indications, lthough the clinical history declared definitely that the disease as enteric fever, or where the swab from a throat failed to eveal the Klebs Loeffler bacillus at a time when every other anifestation pointed definitely to diphtheria. Quite parallel, ndeed, to this in the field of clinical observation is the failure ow and then to detect by the ear any unmistakable alteration n the quality of a respiratory murmur at a time when an ccasional hæmoptysis has definitely raised the question of ncipient phthisis. All these, it is true, are negative examples, nd do not in the least degree detract from the value of bacteiological investigation when the results obtained are of a ositive character. Within these limitations, however, bacterioogy can render invaluable help in the recognition of disease; nd we may fairly anticipate an extension of this help beyond he four or five diseases which at present form the horizon of ublic health bacteriology in this country, at least.

Indeed, if one were asked in what direction bacteriological elp in the recognition of disease is most urgently required at resent, scarlet fever lies ready to hand as an illustration. One s almost disposed to apologise for exalting so common a disease o this pre-eminence, but I know of no other disease of this lass in which one is so often left speculating as to the precise ature of the sore throat which affects persons more or less emonstrably associated with others in whom the fully developed scarlatinal attack is manifest. That these throat affections are specifically infectious while the symptoms continue is, I think, not doubtful; but the duration of infectivity beyond this is at least open to question. Clinically, there may be nothing to distinguish them, save the association with unmistakable cases of the fully developed disease, but much administrative action depends on the decision. School attendance is dislocated, family life frequently interrupted, and milk supplies imperilled; and the best advice we can give is that time must be allowed for the development of evidence confirmatory or otherwise, and that for the present the public should have the benefit of the doubt. In definite relation with the recognition of disease for purposes of isolation is the question of bacteriological evidence of recovery. In connection with diphtheria, experience on this point is being gradually accumulated; and it is a hope not without some promise of fulfilment that return cases of scarlet fever may cease when the bacteriology of the post-nasal cavities, and probably also of the eczematous sequelæ affecting the anterior nares and ears, are more fully known.

Passing from the strictly clinical value of bacteriological enquiry there are already in evidence several illustrations of its application to purely epidemicological purposes. In two outbreaks of enteric fever from milk infection, and in a third occurring in a residential school which came under my own observation, we found when the source of the infection came to be enquired into, that in each instance there had been an antecedent illness, unrecognised as to its nature at the time but presenting distinct Widal reaction when the blood was examined several weeks after recovery. The particulars of these have already been published, but a reference here will serve as a further illustration of the value of bacteriological enquiry in public health administration. Extending our view, however, beyond the limited application of this form of enquiry to the sick man or his intimates, let us ask in what other directions bacteriological enquiry may prove to be fruitful.

Bovine tuberculosis—tuberculous udder—infective milk—are terms replete with significance, but they do not cover all the sources of tubercular infection. Take one illustration. If the phthisis death-rate of several districts is compared with the rate of all the other forms of tubercular diseases taken together, it will, I think, be found that no parallelism exists. It is not where phthisis is most prevalent that there is also the highest non-phthisis rate. In Glasgow during several years of the present decade the phthisis deaths were related to the non-phthisis tuberculous deaths in the proportion respectively of 5 to 2 for the whole city; in the district with the highest phthisis death-rate the relationship was 7 to 2; in others it was barely 2 to 1. That is after correcting for age distribution. Some light might be thrown on this disparity were one able to compare the non-phthisical forms with the death-rate of unoccupied females, because the reduction in the phthisis death-rate which has taken place throughout the country has been accompanied by a striking transference of the sex incidence since 1866. Prior to that year males had a lower mortality from phthisis than females, since then it is the female rate which is the lower. As a question on etiology this broadly suggests a comparison of what one might call the home influences which pre-dispose to phthisis, and the occupational influences, for generally speaking it is the women who stay at home and the men who go abroad. We know something of the bacteriology of water, of milk, of air, and soil, but we still wait for a classification of the microscopic fauna which lurk among the dust of the ill-ventilated and badly-kept workroom.

In a similar way I think an investigation of the dust of households would shed some light on the causes of autumnal diarrhœa. "Dietetic errors" is a favourite phrase, but unsatisfactory. Our errors in diet are not confined to the autumn months. Nor can records of temperatures and rainfall express more than certain physical conditions on which vital action lepends. Heat alone does not produce life, nor does water; ut heat and moisture together are necessary for organic life, nd in this case the life in question is that of the germ of a articular disease. The dust of the household, the food which s exposed to it, and the consumer who suffers in consequence, f made the subject of systematic investigation from the standoint of bacteriology would add, I believe, much to our knowedge of the various affections which by consent we agree to erm autumnal diarrhœa.

Dr. H. Stott (East Sussex Sanitary Combined District) said acteriology was a most interesting study and most efficacious in ealing with the difficult question of infectious diseases. Some iseases, such as diphtheria, were very difficult to diagnose in the irst stage, and it was important to know whether a case of that kind f disease had actually occurred. Many sanitary authorities had dopted the plan of having samples of blood and swabs from the hroat submitted to bacteriological examination. Such examination vas a most important means of preventing the spread in infectious iseases.

Dr. E. W. Hope (Liverpool) called attention to one or two irections in which bacteriology was related to public health. Everyone was cognisant of what had been done in Manchester by Dr. Delepine and in Liverpool by Dr. Boyce in regard to bacteriology for diagnosis and curative purposes, and in addition to this it entered largely into questions of prevention. They knew that by its means anthrax had been traced from the tanneries to the store yard, and then to dust in the holds of vessels which had imported the hides. The value of bacteriological investigation in milk had bearing upon the very important question of the use of preservatives in food; another important direction in which it might be applied was in ascertaining the cause of autumnal diarrhœa. In Scotland infantile mortality from this complaint was very small compared with that in English towns, and it might be interesting if he mentioned that bacilli which, when injected into a guinea-pig either killed it or occasioned considerable constitutional disturbance, had been found in the feeding-bottles of infants as well as in the vomited matter and excreta of infants suffering from choleraic diarrhœa. These were exceedingly important ways in which bacteriology could be applied to preventive medicine in addition to diagnosis, and to curative medicine.

Dr. F. Bond (Gloucester) objected that if a Medical Officer of Health had a case notified to him as one of diphtheria, and he visited it and found that it was not a case of diphtheria, then he would be placed in the awkward position of having to account for the presence of diphtheria in his district when he had strong reasons for supposing that it did not exist.

Dr. J. **Groves** (Carisbrooke) wished that the question of diarrhœa might be settled; it ought to be and he did not see how it was to be done until they brought bacteriology to bear upon it more determinedly than they had in the past. Dr. Armstrong had said it was anomalous to pay a man 2s. 6d. for notifying a case as one of infectious disease when it might not be so after all. What did it matter? They had much better pay 2s. 6d. for the notification of a case that was doubtful than run the risk of infection. Dr. Bond had said that if the Medical Officer of Health accepted the notification in such instances he was placed in an awkward position, but the medical officer could not go behind the notification. It was much better that twenty doubtful cases should be notified, and that the medical officer of health should have a lot of trouble over them, than that one real case should pass. He thought they had to encourage the medical practitioner to notify whenever he was in doubt, and if it was necessary to clear up the point they could go to the bacteriologist who would help them to do it. His own idea was that it did not matter very much after all, so far as the public health went; it was a matter of clinical interest as to whether a case described as diphtheria was correctly so described, and the public safety was what they had to look at.

Dr. **Williams** (Flint) drew attention to this difficulty: The bacteriologist had to admit very often that when a case of diphtheria was notified he could not find the bacillus, and yet there were all the sequalæ of diphtheria as such. And with typhoid it was the same; it was declared at the British Medical Association meetings that they did not know the typhoid bacillus from the cow-dung bacillus.

The President of the Conference (Dr. T. Orme Dudfield) remarked that it would be very interesting to the conference if Dr. Chalmers could tell them, in his reply, why the death rate from diarrhœa was so much lower in Scotland than in England.

Dr. A. K. **Chalmers** (Glasgow) said that peculiarity had been noticed for a considerable number of years, and he believed the same observation was true with regard to diphtheria. It might in part be explained by the system of cleansing adopted. Removal by water carriage was the rule, and pail closets were not largely used. Diarrhœal prevalence was very much a matter, he thought, of surface cleanliness in the neighbourhood of houses. Replying to other observations he remarked that for a doctor openly to express doubt as to the nature of an infectious illness was fatal to his reputation, and it might be that in notifying many cases as infectious disease medical men based their action on probabilities; but this was done in the public interest, and therefore he thought should be done at the public expense, even if it implied the necessity for bacteriological enquiry.

Diphtheria and Sore Throat," by JOHN ROBERTSON, M.D., B.Sc. Edin., Medical Officer of Health, Sheffield.

DURING the past eleven months diphtheria has been exceptionally prevalent in Sheffield, and I have had an opportunity of making observations on certain of the relationships which xist between cases of sore throat and true diphtheria.

To begin with, it may be stated that Sheffield has for a long number of years enjoyed an immunity from diphtheria in epidemic form to a greater extent than most of the other arge cities in England.

Mortality Rates per Million from Diphtheria.

Year.	Sheffield.	London.	England, excluding London.
1871—1880	89	299	287
1881—1890	79	419	287
1891—1895	198	601	281
1896	180	590	232
1897	172	510	195
1898	283	390	204
Mean of 28 years.	166	471	247

While diphtheria has not been present in epidemic form, there has been a considerable number of sporadic cases—about 200 notified annually. These cases appear to have differed from those occurring during the epidemic period only in the fact that they showed little or no tendency to spread. Indeed, it has been very uncommon to find more than one such case in a house, in marked contrast to the frequency with which multiple cases have occurred during the epidemic period. During the years 1891 to 1897 the case mortality among these sporadic cases was 38 per cent., so that it is impossible to doubt the accuracy of the diagnosis.

The history of the present epidemic is briefly as follows:—The first cases occurred among a group of relatives and friends, and were very clearly traced to personal contact. These cases were probably not in any way contracted at school, but the affected children all attended one of the large board schools, and soon this school became a most active distributor of infection. The school was closed with very beneficial results, so far as stopping the spread of the disease among its children was concerned, but the area affected has continued very slowly to enlarge, not more than one half of the city being affected as yet.

From an epidemiological point of view, it is extremely difficult to explain why diphtheria should, in Sheffield, suddenly assume an epidemic form after being for so many years present in sporadic form. The organism found in the throats of patients, both in its cultural characters and in its pathogenicity, is undoubtedly the same in both forms of the disease.

The experience of Sheffield is, of course, identical with that of many other towns, and so far, I do not know of any good and sufficient explanation of diphtheria remaining sporadic for so long a period.

The Sheffield outbreak has been remarkable for the slow manner in which the infected area has increased. This, I am sure, is due to the fact that personal infection is the all-important means of spreading the disease; and that as children of the working classes do not often go far from home, the infected area has spread very slowly.

The points which I desire to draw your attention to are only indirectly connected with the present outbreak, they are:

1st. That during the epidemic of diphtheria on two occasions infectious sore throat has been widely prevalent over the whole city without apparently in any way influencing the spread of the disease.

2nd. That during the present epidemic a large number of mild unrecognised cases of diphtheria have occurred in the infected area, and from experience in bacteriologically examining the throats of such cases during the past five years I feel certain that such cases are most potent in spreading the infection.

As regards the occurrence of infectious sore throat during diphtheria prevalence—it has been so frequently recorded in official and other reports that antecedent to the outbreak of diphtheria there occurred an unusually large number of cases of sore throat—that it has been assumed that there has been a close connection between these and the cases of true diphtheria.

The theory of progressive increase of virulence has been suggested as an explanation. I have never seen it expressed in so many words but the impression conveyed is that non-diphtheritic sore throats are capable of developing into the true diphtheria cases during their passage from one throat to another.

Since 1893 I have examined bacteriologically a very considerable number of cultures from cases of sore throat and diphtheria, and acting in the double capacity of bacteriologist and health officer I have been able to follow up what appeared to be probable connecting links.

It is impossible to put in systematic form the results of these examinations, but the conviction which I have formed from this work is, that there is nothing more than an accidental connection between these cases of non-diphtheritic infectious sore throat and those of true diphtheria.

My experience coincides with that of others in so far as sore throat seems to predispose to diphtheria to a very limited extent.

There may of course be cases of simple infectious sore throat in a district antecedent to an outbreak of diphtheria, but I am inclined to believe, as a result of pretty considerable experience in the examination of such throats, that the so-called sore throats which are found antecedent to an outbreak of diphtheria are in themselves mild cases of true diphtheria.

Since the present epidemic of diphtheria commenced in Sheffield, two well-marked epidemics of simple infectious sore throat have occurred, one in November and December of 1898, and one in March and April of 1899.

These were widespread, and during their prevalence I examined a large number of cases bacteriologically, and was able to satisfy myself of their true nature.

Such cases did not appear to influence the spread of diphtheria in the slightest degree.

The other point I desire to draw attention to is the frequency with which cases of diphtheria occur which are unrecognised by the patient, and cannot be diagnosed from the clinical signs and symptoms.

The importance of this very difficult group of cases is one which, I think, is not yet sufficiently recognised.

The first case of this kind which came under my notice was that of an opera singer in a travelling company, who had lived in lodgings in a house where there was a case of diphtheria. This actress remained a week in each of three towns and spread the disease in two of these. She then came to St. Helens, and communicated the disease to a companion who occupied the same rooms. She had most typical diphtheria bacilli in her throat, but was entirely unaware of any throat trouble. During the whole time that she was spreading infection she continued to sing every night, without in any way being inconvenienced.

I have met with at least a dozen other cases where infection has been spread by persons who considered themselves in perfectly good health, and I have now met with a large number of persons who, although they did not apparently spread the disease, yet carried in their throats the organism in its typical form. It is not by any means uncommon to find the diphtheria bacillus in the throats of nurses and those attending on the sick, and in those residing in the same house.

Then another group of cases, which appears to be of the greatest importance, is that of school children found to be infectious without their parents being aware of it.

I have, on many occasions, taken the precautions, when diphtheria appeared to be spread by school attendance, of examining the throats of all children attending the suspected school. I have examined probably over 8,000 children in this way. *I have never by a physical examination alone been able to detect a single case of diphtheria.* It has been my custom to group the children thus examined into two classes: *(a)*, those apparently healthy, (*b*), those having some suspicious sign or symptom of throat affection.

The number of children in our public elementary schools who have conditions of the throat which depart from the normal healthy conditions is very large, and it is, I believe, impossible without a bacteriological examination of every child's throat, to detect all those that are infectious. Such an examination, of course, is out of the question, and therefore I have only examined the five per cent. or ten per cent. of children whose throats looked most suspicious. The results have varied at different schools, but as an example I give the result obtained from the examination of 2,335 children attending three schools. The throats of 153 of the most likely of these children were examined bacteriologically, and in 27 cases, or 17 per cent., typical diphtheria bacilli were present; in 11 other cases, or 7 per cent., the organisms present were not quite typical, but were probably diphtheria bacilli.

The evidence obtained in this way was of great value in deciding as to the closing of schools. The after-history of most of these children has been followed up—in some a typical attack of the disease followed, in others pareisis and paralysis followed; but in the majority of cases no untoward symptom was noticed.

It is not necessary here to discuss the identity of such organisms found in the throats of persons in good health. Personally I have not the slightest doubt as to their nature. I have on several occasions tested their pathogenicity. Sometimes they are of the long variety, at other times of the short variety.

The practical point then is that, whenever we have to deal with cases of true diphtheria, we are likely at the same time to have cases of the unrecognised type often capable of spreading virulent infection.

So frequently have I been able to trace the spread of the disease to such cases that I have come to the conclusion that they form one of the most important features in dealing with outbreaks of diphtheria.

The occurrence of these cases appears to account for the very intractable character of many outbreaks of diphtheria in different parts of the country; they do not, however, help to explain the very curious and general prevalence of the disease in some of the large cities of this country at the present time.

Notification of Consumption: its Pros and Cons. Remarks Introductory to a Discussion on the Prevention of Phthisis," *by* ARTHUR NEWSHOLME, M.D., F.R.C.P.

(FELLOW.)

IE Prevention of Phthisis has already during the present
ır formed the subject of important discussions at Sessions
the Incorporated Society of Medical Officers of Health
ınuary), and of the British Medical Association (August).
importance, however, more than justifies a return to the
:stion at this large Conference of Medical Officers of Health,
l I venture to express the hope that as the result of our
iberations the following resolution will be passed unanimously,
l that it will form the basis of practical steps in the various
ıitary districts with which we are officially connected.

It will be accepted as a truism that in order to be able to
:e preventive measures against phthisis, knowledge must be
:sessed of the cases of this disease. The only question is,
ıll this knowledge be confined to the medical practitioner and
patient, or shall the Medical Officer of Health also be called
to co-operate in the proposed preventive measures?

Distinguished physicians have advocated that houses should
cleansed and purified after death from phthisis, apparently
aware that this is already done in many sanitary districts.
ey, and others that take the same view, do not appear to
.lise how much valuable time is lost by merely acting after
ıths from phthisis. Protracted exposure to infection, even
ong the predisposed relatives of a phthisical patient, is
ıally necessary before the tubercle bacillus finds a suitable
man nidus for its growth in the heretofore healthy occupants
the infected house. It is obviously of the utmost importance
:refore that precautionary measures should be begun at an
·ly date, and not postponed until after the death of the
.t patient. Such a postponement of measures of cleansing
l disinfection means that among the poor, who are migratory
their habits, house after house may have been infected,
:hout the slightest attempt to protect the subsequent tenants
the vacated houses.

It may be urged that all that is necessary during the life
the patient is to disinfect or destroy the sputa, and the
dical practitioner is the proper person to regulate this
tter. I do not admit that disinfection of sputa is the only
quirement for prevention of phthisis during the life of the
:ient. Even if it were, it is advisable that the patient's
gard to necessary precautions should be increased by asking
n to peruse official instructions, such as the non-alarmist

instructions (appended) which
with every phthisical patient w
to me. There can be no antag
and those furnished by the me

The notification of cases o
Officer of Health also to have
every phthisical home, and t
Opinions will doubtless diffe
direct infection from dried s
overcrowded and damp dwel
other hand, have in the ca
hygienist is he who attempt
the causation of phthisis.

It will be said, however,
existing laws to diminish
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notification of cases of ph
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notification of phthisis,
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(Notification) Act, I
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To the Sanitary Commi

Gentlemen,—It wil
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June only represent a small proportion of the total cases of phthisis in Brighton, even among the poorer part of the population. This may be made clearer from the fact that, during the last six months, 76 deaths from phthisis occurred in the whole of Brighton, 12 of these among the 56 notified cases.

The total number of phthisical houses visited during the past half-year has been, therefore, 120. In 44 of these, as will be seen from the preceding remarks, the visits were made comparatively early, and the necessary precautions were taken for a considerable period during the life of the patient; while in the remaining 76 the precautionary measures, which consisted in stripping the wall paper, limewashing, &c., could only date from the death of the patient, when already a large amount of mischief had been done.

The utility of the visits in the 56 notified cases was not limited to these measures for taking precautions against the spread of infection. The following insanitary conditions were removed as the results of the visits to the 120 houses mentioned above:—

To strip, whitewash, and cleanse the rooms or the entire house, according to circumstances	59
Houses condemned, and will soon be demolished	4
Overcrowded house	1
To cease to occupy undergound dwellings ..	1
To cease to continue keeping fowls	1
To cleanse the workshop and compo the damp walls	2
To ventilate the basement of the house.. ..	1
To provide a window on the dark and unventilated staircase	3
To relay the drain	2
To provide rain-water guttering..	1
To repair the leaky roof	2
To compo the wall of the house..	1
To pave the yard around the house	1
To remove the brick passage in the house and ventilate under the floor of the living room	1
To remove accumulations of house refuse ..	2
To repair the dust bin	2

There can, I think, be no doubt that the past half-year's work has been distinctly valuable in raising the standard of health in the town. Similar work ought, in my opinion, to be extended. Although the present system of voluntary notification has been fairly successful, I think it would be more useful if we were prepared to pay the same fee for voluntary notification of cases of phthisis as is done for compulsory notification of the notifiable infectious diseases. In the majority of such cases, the fee would be one shilling, as most cases that would be notified would be in Parochial, Dispensary, and Hospital practice.

I beg to recommend that I be authorised to do this during the ensuing six months, and that I report at the end of that time to your Committee the results which have ensued.

The endorsement and reiteration of the advice of the private
actitioner as to disinfection of sputa and the removal of in-
nitary conditions in phthisical houses do not exhaust the utility
notification of phthisis. Notification also furnishes valuable
formation as to the incidence of phthisis. Dr. Ransome has
own that in certain streets and houses phthisis clings and
evails to an excessive extent. Notification of phthisis will
able us to localise our "plague-spots," and take effective
easures for their removal.

It is clear that phthisis is most prevalent in overcrowded
uses. Overcrowding is the central problem in public health.
is one which surpasses our present ability completely to solve.
radually some palliative measures against it are being adopted,
d cheap trains and trams for those who can, and block-
ellings of an improved type for those who cannot migrate to
e suburbs, will doubtless help in time to relieve the stress,
ough they do not entirely meet the requirements of the case.
ut in the meantime for many years to come a large amount
overcrowding must continue in our crowded centres of popu-
tion. Is it not better that in connection with this state of
atters, we should have official knowledge of cases of phthisis,
an that we should be blindly attempting to abate such casual
ses of overcrowding as are detected by sanitary inspectors?
nowing of cases of phthisis we can take intelligent precautions
ainst its spread in overcrowded houses; while ignorant of
em, we are spending and exhausting our energies on over-
owded houses of much less importance, from the standpoint of
e prevention of the spread of disease. Furthermore, if it be
gued that the removal of overcrowding would render the
tification of phthisis superfluous, is it not equally true *ex*
pothesi that the notification of phthisis will give us more
curate knowledge of the incidence of overcrowding than
erely counting heads, and thus enable us to deal more
iciently with it?

The only valid argument against the notification of phthisis
nich I have heard, is based on the additional work incurred
it. This argument holds good in favour of the Medical
fficer of Health receiving additional skilled assistance, but
rely not against his undertaking additional work, the hopes
immense practical benefit from which are greater than in
y other disease concerning which official preventive measures
e at present adopted. I cannot admit the impracticability of
e Medical Officer of Health visiting all notified cases of
thisis. During the last six months this has been done in
ighton, and there will be no real difficulty in his continuing
make the first visits at each house, even though voluntary
tifications increase ten-fold. After the first visit, no difficulty

arises in arranging for a Sanitary Inspector to make periodical visits in order to see to the remedying of sanitary defects, the disinfection of vacated rooms, and so on.

I have not exhausted the arguments in favour of the notification of phthisis. This subject is discussed in further detail in valuable papers by Dr. Niven, and by Dr. Byrom Bramwell, and by the present writer in a paper in "Public Health," (February, 1899).

As to whether notification of phthisis shall be voluntary or compulsory, I am not prepared to speak dogmatically. Each sanitary authority should be in a legal position to decide the matter for themselves, guided by their medical officer of health's advice and by the special local requirements of their district. Fortunately phthisis is a disease in which one may reasonably expect that, if 10 per cent. of the cases are notified, 10 per cent. of the benefit to be gained by complete notification will accrue. Possibly more than 10 per cent. of the benefit from complete notification will be secured, if the cases notified, as is likely, are amongst the poorest classes of the community. Hence voluntary notification, as a step in the right direction, will undoubtedly be of great service, and for the present I am contented with it.

In conclusion, I beg to propose the following resolution, which I hope will meet with the approval of this Conference, and secure a basis for united action in regard to the prevention of phthisis:—

"That this Conference of Medical Officers of Health is strongly of opinion, that phthisis—which causes more deaths in England than any other disease (one-fourth of the total deaths at ages 15-55 being due to this cause)—is preventible by measures which are completely within the range of personal and public hygiene. That of such measures, the disinfection or destruction of the sputa of phthisical patients, and the abatement of insanitary conditions of dwelling houses and workplaces, especially those associated with overcrowding, hold the first place. That for the carrying out of such measures, notifications of cases of phthisis to the Medical Officer of Health are indispensible, to secure economy of effort and the maximum benefit. That this Conference recommend the notification of phthisis for adoption in all sanitary districts, the question as to whether it be voluntary or compulsory being left to the discretion of Local Sanitary Authorities, and that the Local Government Board be urged by the Council of The Sanitary Institute to take the necessary steps to legalise such notification."

[*For discussion on this paper, see page* 56.]

Should a Sanitary Authority contribute towards the support of Sanatoria for Consumptives," *by* HAROLD SCURFIELD, M.D., D.P.H., M.O.H., Sunderland.

(MEMBER.)

ABSTRACT.

BOUT 220 people die every year in Sunderland from phthisis lmonalis. The average for the last fifteen years is 219·6. ie average for the first eight years of the fifteen is 220, and e average for the last seven years is 219. Practically speak- g, the number of deaths remains the same, while the pulation increases. The increase of the population during e last fifteen years has been from 120,000 to 144,000. This ans, on the average, not taking any account of the cases of nsumption that recover, that every case of consumption ich ends fatally, succeeds in passing a fatal attack of the sease to one person. If we suppose an average case of con- mption, reckoning from the appearance of clinical signs of e disease, to last about three years, there will be in Sunder- nd at any one time 220 cases in the first year of the disease, 0 in the second, and 220 in the third, or about 660 cases in l which will end fatally. The slight cases which become red without being recognized, and of which we have evidence post-mortems, probably become cured before reaching the fectious stage and need not be included in this calculation.

If only 10 beds of a Sanatorium were placed at the disposal Sunderland, they would provide a four months' course of eatment for 30 patients annually.

Dr. Walters, in his book "Sanatoria for Consumptives," ys: "Generally speaking, one may say that from one-fourth one-third of the patients treated in Sanatoria are practically ired or a still greater proportion if they are treated in earlier ages. Probably systematic and prolonged treatment from an rly stage would restore to health from one-half to two-thirds the consumptive patients even without the advantage of the lpine or other high altitude station."

We might fairly expect that of the 30 patients treated nually, five or six would be cured without relapse, and that ost of the remainder would learn how to dispose of their pectoration in such a way as not to be a danger to their milies on their return home, if the home conditions were asonably good. Judging from the number of families in underland who occupy separate cottages, I should think that least a sixth of the thirty on their return home would able to remain there without being a source of infec- on. Let us suppose that we get results not nearly so good d that only one case of otherwise fatal consumption is cured in the sanatorium every year, and that only one case is taught not to transmit the disease, the reduction in the prevalence of the disease would still be considerable. The cures would take place mostly before the most infectious stage of the disease was reached, and we may fairly reckon that two-thirds of the patients cured would be cured before they had succeeded in transmitting a fatal attack of the disease. This would mean that instead of the existing 660 consumptives handing on a fatal attack of the disease to 660 persons, five of the 660 would fail to transmit a fatal attack of the disease, and at the end of 21 years we should only have 625 cases of consumption doomed to prove fatal, instead of 660. Thus a small sanatorium, obtaining results very much inferior to those at present in existence would achieve for a big town in the course of a few years a very appreciable reduction in the prevalence of this not very easily communicated disease.

In Germany the provision of sanatoria for poor people has been made easier by the law compelling persons with small incomes to insure against sickness.

I believe there are about 33 "Sanatoria for the People" in Germany, either in existence or in the course of construction. In England it seems likely that Boards of Guardians will, in the course of time, combine to establish sanatoria for paupers who are suitable cases for the treatment; but the establishment and maintenance of sanatoria for people of limited means, who are not paupers, will be left to philanthropic efforts and voluntary subscriptions, including workmen's subscriptions; and, in my opinion, Sanitary Authorities will be fully justified from the point of view of preventive medicine in contributing towards the maintenance of sanatoria of this latter description.

[*This discussion applies to the two preceding papers by* DR. ARTHUR NEWSHOLME *and* DR. H. SCURFIELD.]

DR. J. B. NIVEN (Manchester) formally seconded Dr. Newsholme's resolution. He said there was a good reason why notification should be compulsory, because it was a rather invidious thing so long as there was a considerable hostile feeling in certain quarters in relation to it, that a medical man should notify cases unless it was required by law. If they could show that notification of phthisis was a necessary and valuable procedure, as no doubt they could, as a result of the voluntary notification which was now established in Manchester and Brighton, then compulsory notification would follow. But he was not as yet sure that it was not a good thing that everyone should not have consumption notified straight off. The subject was one of difficulty. The administration was constant and steady, and that, from one point of view was a great advantage, but, on the other hand, the disease lasted a very long time, and if the administration was going to be successful, it would be

essary to follow up the cases and see that efficient preventive
asures were taken. It was easy to show how this could be done,
y would of course have a certain amount of multiple notifications
the same case, but there would be no difficulty in devising a
eme which should provide, ultimately, for the appointment of the
istant medical officers to do this work. Undoubtedly, the great
nt to be attended to was cleanliness. The medical officer who took
s matter up would have to most carefully guard the interest of the
nsumptive people. It was very necessary to impress upon the public
nd the fact that there was no danger attaching to the consumptive
ient in respect to those about him, provided he observed the
essary precautions.

Dr. R. SYDNEY MARSDEN (Birkenhead) said although the title
the paper was "The Prevention of Phthisis," the real question
y had to discuss was whether phthisis was to be compulsorily
tified or not, for to this point Dr. Newsholme had chiefly directed
r attention, and, personally, he was entirely opposed to the *com-*
lsory notification of phthisis. What where the chief arguments
t forward by Dr. Newsholme? He told them that it would be a
ans of finding out insanitary properties. The discovery and
nolition of insanitary properties ought not to be dependent upon
notification of phthisis. In the next place, he said it would
ble them to find out cases of overcrowding. That, again, ought to
ne within the ordinary routine of a Medical Officer of Health. As
the account of extra work which would be thrown upon the medical
icer by the adoption of the proposal, that he admitted was a mere
ey, because if he could not do it himself he could get an assistant,
t Dr. Niven's remarks showed that in their own minds the advo-
es of compulsory notification saw very great danger in the intro-
ction of the system. Supposing they had compulsory notification,
would ask whether phthisis was absolutely certain of diagnosis?
thought no one could say it was. But supposing they had notifi-
ion and fairly correct diagnosis, what were they going to do? If
y were going to take action at all, it must be complete, otherwise
his mind it was useless. The New York system was thought a
od deal of in many quarters, and he quite admitted the excellent
ints it contained, but it went to extremes, and he was satisfied that
e people of this country would not tolerate being overruled as the
izens of New York were by the Health Department in this matter.
ere were, however, certain things that they would have to do if
ey adopted this proposal. They would have to put patients under
rveillance by the Medical Officer of Health, and issue regulations
r their conduct. There must be no surplus furniture in the house
consumptive persons; they must not mix with other people under
dinary conditions, etc., and tuberculous children must not be sent
ordinary schools. A sufferer from phthisis would soon become a
arked person, a burden to himself, his relatives, and his friends, and
e advantages obtained would not be commensurable with the results.
ey might some day come to what Dr. Newsholme had suggested
hen education had gone further, but if as reasonable men they

called upon the Government at the present time to institute compulsory notification of phthisis they would set up a great amount of alarm, and cause an infinite degree of misery in the minds of a great many people who either are, or think themselves to be, affected with tuberculosis. To compel every medical man to notify every suspected case of consumption, and to treat the house in which the case occurred as if it contained small-pox or typhoid fever would be simply outrageous. He hoped it would not be imagined for a moment that he was opposed to the sentiment which underlay Dr. Newsholme's paper. He supposed they all agreed with him in theory. The only thing that he disagreed from was placing a number of people under observation and State control through the Medical Officer of Health. There was a very dangerous paragraph in Dr. Newsholme's and Dr. Niven's motion, viz., that in which it was said that notifications of phthisis are indispensable to secure economy of effort and the maximum benefit, and that this Conference recommends it, etc. That was all very nice, but it did not take the sting out of the tail, which was in the form of a recommendation to the Government to enforce notification of phthisis. He therefore hoped that the motion would not be carried.

Dr. E. W. HOPE (Liverpool) said his position was about midway between the positions assumed by the two previous speakers. The Health Committee of the City, whose officer he was, had adopted the voluntary system of notification. They were willing that whenever any case of phthisis had occurred in which the medical attendant considered disinfection was desirable, or any sanitary precautions should be taken, that the sanitary officer should acquiesce in his wishes. Personally he could not agree with the proposition at all. He thought it misleading in many ways. It begged an important question; for example, it said that preventive measures were completely within the range of personal hygiene. He wished he could see they were so. It meant that the demolition of insanitary properties, the raising of the poor, &c., were easy things and within the range of personal and public hygiene. He was afraid that they were not. In every large city they found hundreds of insanitary houses which sooner or later must be demolished, and many corporations were dealing with them in this manner. They did not need to be told why: one of the chief reasons was the presence of tuberculosis. They knew it was there, they did not want to be notified again. The gentleman who had drawn up this resolution said, "Take the people away to the suburbs." He wished they could be taken away, but they wanted to live near their work. It might be possible in the future to transfer people from overcrowded areas in the towns to the suburbs, and so lessen the amount of phthisis resulting from the present conditions. If the compulsory notification of phthisis were adopted to-morrow, the probability was that they could make no further preventive efforts than they made at present. The decline in the rate of mortality from tubercle in this country was extraordinary, in Liverpool it was almost phenomenal. For the decade ending 1875, the total number of deaths per 10,000 from tuberculosis was 430, in last decade it was 309, and in the last three years 256. These ires clearly indicated that they were on the right lines, and they st persevere on those lines. He did not think the public were pared for anything more than the mildest form of voluntary ification. With regard to sanatoria, he agreed with the view ressed by Dr. Scurfield, and was glad to say the various Poor v Boards in Liverpool were combining to establish sanatoria, ilst something further was being done by the munificence of vate persons in the way of providing for those above the pauper ss.

Dr. P. **Boobbyer** (Nottingham) said he was exceedingly sorry to find iself in opposition to two such members of the service as Drs. wsholme and Niven, but he was entirely opposed to their views h respect to the question of the compulsory notification of hisis at the present time. He did not mean to imply that he approved of preventive action, of even the strongest practicable ventive action, against the spread of tuberculous diseases, as of er preventible disorders; but he was confident that they must ceed slowly in these matters if they wished to attain success and ure public approval and support. In Nottingham, he said, they l been slowly educating the public mind since 1892, by means of flets, free disinfection, and the encouragement of voluntary noti- ation, to consider tubercle as curable, infectious, and preventible. her large towns, especially in the north of England, had been doing s, and perhaps doing it more vigorously, for a longer period. In ttingham, however, he was pleased to say, they were doing an ever reasing work, as a result of the advertisement that had thus been en to the subject. A week never went by without their being led upon to advise what should be done, or to do certain things, vards the cure or prevention of the complaint. After all it must remembered that it was far more important to induce people to ose fresh air and cleanliness for their own sakes on rational unds, than to persuade them to submit to restrictive legislation. t what they were aiming at here was the adoption of compulsory tification for phthisis in the not distant future. They must not get that in Great Britain at least, compulsory notification and spital isolation were not yet at all popular things, except where the blic mind was convinced of their necessity. His contention was that, spite of what had been done, in spite of the weightiest ex-cathedra tements, public feeling was not yet convinced of such necessity for thisis. Even with respect to some of the acute specific diseases eduled as "dangerous infectious diseases," public opinion was by means unanimous, especially in some large towns where the rking classes predominated, and where the isolation hospital ac- mmodation was not altogether satisfactory; and the application of is system to consumption meant something very much more dis- rbing to the individuals and families affected, as well as expensive the community, than it did in the case of those diseases, the tacks of which were clearly determinate, and were over and done ith in a few weeks. Dr. Newsholme had said that if people would only take the precautions which were required, no demand would be made for the isolation of patients, but he (Dr. Boobbyer) would ask, in how many cases of phthisis with which they were ordinarily called upon to deal in very poor neighbourhoods it would be possible for the people, under existing circumstances, to do what would necessarily be required of them by the executive officers? In Nottingham, recently, a movement had been very successfully inaugurated to establish a sanatorium for phthisis. Directly the project was mooted it was declared by some "friends of the people" that this was the thin end of the wedge, and that the local authority were going in for the compulsory notification of phthisis, with all its armamentarium of prevention. It was not until the public had been informed that such action was not at all in immediate contemplation, that they could be got to give their approval to the sanatorium scheme. At the present time this project was well afoot and going strongly, and he was glad to think that by the excellent object lesson of the sanatorium's practical work, they would soon be able to shew people that tuberculous disease was both preventable and curable, and thus pave the way to the adoption of notification, which, of course, must ultimately follow, if we were to deal at all effectively with consumption as it existed in the community.

Bailie Pollard (Chairman of the Public Health Committee of Edinburgh) said the Corporation of that City appointed a sub-committee of the Health Committee to consider whether any obligation lay upon the municipality with reference to consumption. After receiving from Sir Henry Littlejohn a report on the conditions of the disease in the City for the year 1898, they convened a meeting of the leading medical men of Edinburgh, representatives of the Medical Faculty of the University, and the Royal Colleges of Physicians and Surgeons. That meeting afforded a good illustration of the adage that "doctors differ." They had, however, a concensus of opinion on this point, that unquestionably an obligation did lie upon the Corporation in reference to this matter. Sir Henry Littlejohn had shown them in his admirable report that last year 530 persons lost their lives in Edinburgh by pulmonary consumption, the average age of those persons being thirty-four years. Two-thirds of those had lived in houses of one, two, or three rooms. It might be estimated that of those who died in such conditions each communicated the disease to at least one other person. The conclusion that the sub-committee came to was—that since doctors had told them that those persons were dying of a disease which in its later stage was most infectious, it was the duty of the Corporation to protect relatives and neighbours who were thus jeopardised, and to provide for the isolation of dangerous cases. Sir Henry Littlejohn suggested that they should have provision to the extent of 100 beds, and he thought it not unlikely that Sir Henry would suggest that the old hospital which they were at present using for fever patients should be so converted as to provide accommodation for 100 extreme cases of consumption. If Sir Henry made such a suggestion Mr. Pollard was satisfied the Corporation would support him. It would practicbe a home for the dying, but it would take away a source of verful and dangerous infection from crowded localities, and so, it s reasonable to believe, result in the saving of many lives in future rs. In conclusion the speaker thought it was needless to go in notification until they were, at all events, in some measure pared to deal with the state of matters that notification would eal. Without notification they had at present, if Edinburgh ght be taken as an example, more knowledge regarding the extent the disease and the conditions of its victims than they were able grapple with. They must educate and prepare the public by king known the facts that lie to their hand. Notification would n be easier to obtain, and ratepayers more willing to pay the costs ich it would entail.

Sir Henry Littlejohn (Edinburgh) said that he was very sorry state that the voice of the medical profession in Edinburgh was ally opposed to the notification of phthisis. Edinburgh consisted nost entirely of medical men and hotel and lodging house keepers, d for him to go against the medical profession would be to commit *o-de-se.* He wished to pay a tribute to Drs. Newsholme and Niven being pioneers in this question, and, old as he was, he believed he ould live to see the day when notification of phthisis would be forced. He was bound to say, however, that even the most elligent of our citizens still required to be educated, and until the blic were more educated he must give his vote against compulsory tification.

Dr. **H. Cooper Pattin** (Norwich) urged that children in the public hools should be taught the usual conditions under which tubercu- is was contracted, the means by which it was most frequently read, and the simple precautions by which the danger of infection uld be minimised; and in his opinion more could be done in that y towards controlling the disease than by notification or sanatoria.

Dr. **J. Groves** (Carisbrooke) remarked that a fee often greased the heels, and if they could have voluntary notifications which would paid for, the medical officers would know where disease existed, he ought to know in the case of phthisis, as well as of any other sease. What the Medical Officer of Health seemed to want, wever, was some authority by which persons who had reached the tively infectious stage of consumption should be removed to a spital where they could not communicate the disease to others, d where they themselves would have something like comfort in eir last days.

The discussion was closed without the resolution being put.

"*The Smoke Nuisance and the Medical Officer of Health*, *by* JOSEPH PRIESTLEY, B.A., M.D., D.P.H., M.O.H., Lambeth.

(FELLOW.)

THE Welsh coal strike of last year (1898) caused public attention to be drawn anew, and with considerable emphasis, to the smoke nuisance, and, as since the strike, the public are still agitating in and out of Parliament for more vigorous action to be taken by sanitary authorities, I am venturing to lay the matter before a Conference of Medical Officers of Health, with a view to expressions of opinions.

From the early part of the present century (1819 and onwards), special attention has been again and again drawn to the nuisance and danger to health arising from the emission into the atmosphere of unburnt or incompletely burnt gases and carbon, and many Commissions and Departmental Enquiries have been appointed and held with a view to finding out means (if any) of minimising such nuisances and dangers to health.

All are agreed that these nuisances and dangers to health are real; all are agreed that anything that contaminates or renders impure the air which is breathed minute by minute, and second by second, reacts on the health of those breathing it; all are agreed, too, that it is possible to practically reduce the emission of black smoke; but, at the same time, all must admit that a certain percentage of smoke is absolutely necessary as representing *directly* the work being done by boilers and furnaces in factories and workshops, and *indirectly* the prosperity of the country.

The public opinion that has been brought to bear on the question has resulted in Acts of Parliament being from time to time passed, such legislative interference being crystallised in the sections of the different Public Health Acts as follows:—

The 1875 Act for England and Wales deals with the question in the nuisance section—91, which defines, or exemplifies, amongst nuisances—"(1) any fireplace or furnace which does not, as far as practicable, consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever; and (2) any chimney (not being the chimney of a private dwelling-house) sending forth *black* smoke in such quantity as to be a nuisance." There is an important proviso to the section to the effect that "where a person is summoned fore any Court in respect of a nuisance arising from a fire- ice or furnace which does not consume the smoke arising from combustible used in such fireplace or furnace, the Court ill hold that no nuisance is created within the meaning of s Act, and dismiss the complaint, if it is satisfied that such place or furnace is constructed in such manner as to consume far as practicable, having regard to the nature of the nufacture or trade, all smoke arising therefrom, and that h fireplace or furnace has been carefully attended to by the son having the charge thereof."

The 1891 Act for London deals with smoke in Sections 23 1 24 as follow:—

Section 23 relates to smoke consumption or burning in mection with furnaces and steam vessels, which must be istructed as far as possible with such an object in view; ilst, where furnaces are so constructed, care must in addition taken by those in charge—*e.g.*, stokers—who by personal gligence may become liable to the fines and penalties mentioned the Act—viz., a fine not exceeding £5, and on a second nviction to a fine of £10; and on each subsequent conviction a fine double the amount of the fine imposed on the last eceding conviction.

All the smoke need not be consumed or burnt, and it is fficient to show that precautions have been taken as far as ssible, both in construction of furnaces and in attention given stokers.

Section 24 consists of two sub-sections—the first of which als with furnaces and fireplaces not consuming their own ioke, and the second with chimneys (not being the chimneys private dwelling-houses) sending forth *black* smoke in such iantity as to be a nuisance—owners of the chimneys not ving the power to defend themselves against the summons by owing that the emission of the *black* smoke was due to the gligence of their servants (*vide* Barnes *v.* Akroyd, L. R., Q. B., 474.)

In connection with Sect. 24 there is a proviso as in the 1875 ct, but this proviso, important as it is, has reference only to e sub-section dealing with furnaces and fireplaces not consum- g their own smoke (*vide* Mekes *v.* King, 53 L. T. (N. S.)), at least so say the lawyers.

The Public Health (Scotland) Act, 1897, defines as a nuisance Section 16, any fireplace or furnace not consuming, as far as acticable, its own smoke, and any chimney (not being the imney of a private dwelling house) sending forth smoke (note ie omission of the qualifying word "black") in such quantity to be a nuisance or injurious or dangerous to health.

In all these Acts, there are one or two points in common, viz.:

(1) That the nuisance must arise from *black* smoke except in the 1897 Act.

(2) That a proviso has been inserted, except in the 1897 Act, whereby a means is offered of contracting out of liability as laid down by the Statutes, but only (so say the lawyers) in respect of fireplaces and furnaces which do not consume their own smoke.

(3) That it is unnecessary to prove the nuisance injurious to health.

The Law then is simple, and the idea of the Legislature theoretically just, for, whilst recognising that *black* smoke is a nuisance (and the blackness and the quantity of such black smoke are all important considerations), it is expressly stated that, with a view to manufacturing industries being protected, no nuisance shall be held to have been committed where the furnaces and boilers are so constructed as to consume, as far as practicable, their own smoke, and where due attention is given to the stoking.

Nothing, I repeat, could be simpler than the state of the law as first propounded, but unfortunately the lawyers have twisted and turned the sections so that, with reference to a nuisance from black smoke issuing from a chimney, the proviso shall not hold good, and that, therefore, black smoke *per se* is a nuisance, and any Authority which can, by its officers or by other witnesses, produce evidence as to the emission of black smoke from a chimney (other than the chimney of a private dwelling house) on a certain date or dates, and for a definite period of time, must of necessity obtain a conviction (penalty or fine), unless the defendants can produce rebutting evidence that on the dates and at the times mentioned, black smoke was not so issuing.

The question as to what is and what is not black smoke is a side issue, and one about which there ought to be little room for quibbling. I am aware that elaborate rules have been laid down for gauging the density of smoke (in my own district manufacturers place up in their furnace rooms coloured diagrams for the use of stokers!), but a simple method that may be adopted with advantage is to regard smoke as black when it is impossible to differentiate where the rim of the chimney ends and the stream of the issuing smoke begins.

Black smoke, then, issuing from a chimney (other than that of a private dwelling-house) is *per se* a nuisance, and taking the opinions of the lawyers as laid down in reported cases and fol-ving out their arguments to their farthest conclusions, the ly way to ensure the provisions of the exemption clauses of e Acts being applicable is to have no chimneys! This is a newhat startling statement, but it is warranted by the exrience of my own Authority before a Court of Summary risdiction at the end of last year in a case in which I was ›pœnaed, as Medical Officer, to give evidence on behalf of defendants to the effect that the best practicable means l been taken to prevent as far as possible or practicable the isance arising from the emission of smoke. My evidence s held to be inadmissible as the summons was taken out in mection with a chimney; that is to say, had there been no imney mentioned, my evidence would have been taken, and defendants in all probability would have got off. In Lonn, to ensure a conviction, to make it compulsory for a ıgistrate to convict, action must be taken under sect. 24,)-sect. *b*, which states that "any chimney (not being the imney of a private dwelling-house) sending forth *black* smoke such quantity as to be a nuisance shall be a nuisance liable be dealt with summarily under the Act."

It naturally follows, and in the case of my Authority actually s followed, that firms which have spent large amounts of ›ney in fitting their furnaces and boilers with smoke prention appliances (*e.g.*, mechanical stokers, steam jets, air ısts, grids, hollow and split bridges, &c.), may be fined as ıch as £50 and £100, because on certain dates black smoke ıs found to be issuing from the chimneys of their furnaces, d no evidence was admissible as to the patent appliances used the kind of fuel employed. Did black smoke on such and ch a date issue from the chimney? If so, conviction must llow.

I do not propose entering upon the subject of the causation black smoke, nor do I propose considering the hundred and e appliances that have been from time to time introduced nd are still being introduced), and which, in the words of the rious patentees, consume *all* smoke arising from furnaces and ilers, and that, too, despite the kind of fuel used—*e.g.*, best elsh coal or leather trimmings. I must, however, remark in ssing that the practically perfect smoke-prevention appliance ıs yet to be introduced, and our colleagues, the engineers, have erefore a magnificent field for the exercise of their ingenuity; ilst careful and frequent stoking of proper, high-class fuel still, in the opinion of those best able to judge, one of the st, if not the best, means of minimising the nuisance from ıoke. What I wish, therefore, to emphasise is that when a m or firms are using the best practicable means, and taking all necessary precautions as to stoking, &c., they ought not to be harassed and persecuted by prosecutions for smoke nuisances by Sanitary Authorities. *All* smoke cannot be prevented except by shutting down all factory and workshop fires; and recognising the difficulty of consuming smoke when once formed, it follows that prevention is better than cure, and such prevention consists in frequent and careful light stokings, with or without mechanical appliances, and the use of suitable fuel—sufficient boiler-power being, of course, a *sine quâ non.*

By such means there ought to be little, if any, black smoke properly so-called, for it must be remembered that black smoke, and black smoke only, is a nuisance when issuing from a boiler or furnace chimney, no action lying against Firms, who, by care and attention, limit the amount of the dark shade of the smoke issuing from their chimneys. Further than this, a reasonable time ought to be allowed for first firings up and the after-stokings, and a reasonable length of time spent in observations by the inspectors. Different towns have laid down different working rules, *e.g.*:

Birmingham	allows	15	min.	black smoke	per hour.
Croydon	,,	10	,,	,,	,,
Blackburn	,,	7	,,	,,	,,
Leeds	,,	5	,,	,,	,,
Manchester	,,	4 to 6	,,	,,	,,
Liverpool	,,	4	,,	,,	,,
Nottingham	,,	3 to 5	,,	,,	,,
Sheffield	,,	2 to 6	,,	,,	,,
L.C.C.	,,	1 to 5	,,	,,	,,

The length of observations vary from 10 minutes in Nottingham to 2 or 3 hours in Bath—hourly observations being the most general, and 5 to 7 minutes the average allowance (maximum) of black smoke per hour.

I ask for consistency of action, and where necessary, prosecutions but not persecutions.

“*Gannister Disease*,” *by* C. L. BIRMINGHAM, M.D.

BY gannister disease I wish to designate an affection of the respiratory system, which prevails to an extent which I shall presently indicate, among those who are employed in mining or grinding, or quarrying, or converting into bricks the material known as gannister. It is a disease of the nature of a diffuse fibrosis, which gradually causes the conversion of so much of the interstitial substance of the lungs into fibroid tissue, as to result in the destruction of a great amount of the pulmonary ing surface, and to lead to death in from two to five years, being then due to exhaustion, or to some affection second- this fibrosis.

the irritant producing this disease is silicious, it becomes nient to place it under the heading *silicosis*, in the group eases comprehended by the term *pneumoconiosis*.

th, on account of the insanitary conditions under which ster workers have to follow their trade, and particularly se of the special characters of the causative agent, the e differs widely from other forms of pneumoconiosis rto described. And, to my mind, it bears no resemblance oever to pulmonary tuberculosis if diagnosis be carried ith ordinary care.

n find no record of a trade disease which furnishes such h death-rate as does gannister disease among those ed in the gannister industry. And I regret to have to ny conviction that it is owing to the careless manner in the supervision of the Board of Trade is exercised over articular industry that many valuable lives are sacrificed year.

nnister is an exceedingly compact, close-grained, and silicious rock, found to occur in the under-clays of the coal measures of certain limited areas of the coalfields orthumberland, Denbighshire (in the neighbourhood of ham), the West Riding of Yorkshire (chiefly about the of the Don, between Penistone and Sheffield), and a few places. It is only in the places that I have specially d that gannister possesses a high commercial value.

is to the gannister industry, as carried on in the valley of on, that my notes especially apply. I lived for several close to the gannister workings, which are fairly extensive is district, and had during my residence in these parts opportunities of becoming acquainted with gannister e and the extent to which it prevailed.

ing to the almost adamantine hardness of gannister, it is l to be practically impossible to produce it in quantity by rdinary methods of mining. And recourse has to be had asting operations, which are carried out mostly with nite.

nnister is carried in the ordinary way in *corves* from the ings in the pits to the surface, and thence conveyed to rful grinding-mills where it is pulverised. It is then to be utilised in the manufacture of the well-known ister bricks and tiles. These latter possess, in the highest e, the power of resisting elevated temperatures such as bricks and tiles would be unable to withstand.

It is because of this unique property that gannister is almost universally used in the lining of the bottoms of Bessemer convertors.

Those engaged in working gannister who are liable to become affected by gannister disease may be divided into three main groups:—

(*a*) Gannister miners (which will include the few gannister quarrymen);
(*b*) Gannister grinders;
(*c*) Gannister brickmakers.

The degree of liability is different in each of these three groups.

Let me first indicate how the miner gets affected.

In consequence of the preparatory drilling for the blasting, a large amount of finely-divided gannister gets scattered about the workman's place. Already, as a result of previous blasting, much gannister dust is about on the floor, walls, &c. The blast is fired. Then suddenly the atmosphere becomes agitated, and then charged with fine gannister dust. Before it has time to settle the miner is compelled to go on with his work breathing this dangerous air. As a result he inspires a certain quantity of finely-divided particles of gannister, and if these get arrested on the moist mucous membranes of the upper air-passages, he is safe—for a time, at least. But the time soon arrives when, either owing to an extra large dose of gannister dust having been inspired, or to the existence of a wounded condition of the mucous membrane due to a simple, acute, or chronic bronchitis, a quantity of the dust becomes implanted in the bronchial or bronchiolar mucous membranes, which the ordinary expulsive mechanism fails to eject. This causes mechanical irritation at first, but leads to reactionary simple inflammation with leucocytal infiltration, which in turn terminates in the production of fibroid tissue.

Before long organisms of suppuration find their way into those areas of simple inflammation, and a form of simple bronchitis results. This constitutes the first objective evidence of gannister in the miner.

Because of the enormous quantity of gannister dust, composed as it is of relatively large very sharp and exceedingly hard particles, which has become settled in the lungs, it is easy to understand how the fibrosis extends rapidly in both lungs. Within a year the clinical type has become fully developed. The miner is now an anæmic enfeebled individual, breathing rapidly and with great difficulty, incapable of making any physical effort, and troubled with a perpetually hacking cough. He walks about his village an object to pity, " waiting for his

" Perhaps he will have four more, commonly he will have two or three years to wait.

is unnecessary for me to picture to you the history of the en gannister grinder or gannister brickmaker. For you eadily understand how these latter classes suffer in almost ely the same manner as the gannister miner.

is desirable that I should now place before you the tics I have collected relating to gannister disease. Before so I wish to explain that I have experienced great lties in collecting my data. And I regret, that for my nal security, I am obliged to withold many facts and ences, which might otherwise greatly enhance my enquiry ny report. But I am confident some investigation will be uted before long, which will fearlessly probe into all the eries of this trade.

e number of gannister workers residing in the Stocks-e-cum-Deepcar district may be taken approximately as 420 and boys during the years to which my figures refer. Of , 56 per cent. are miners, *i.e.*, engaged in winning gannister e pits, the remaining 44 per cent. being employed in the er manipulation of gannister above ground, *i.e.*, as grinders, makers, labourers, etc. The labourers never suffer from ster disease. They constitute between 16 and 17 per of the total number above given. If I reject the number bourers then from my calculations, I am left to deal with gannister workers residing in Stocksbridge-cum-Deepcar, to contract gannister disease.

xt turning to the number of deaths record as due to ister disease, I find during the years 1891, 1892 and 1893, re attributed to gannister disease. This is an absurdly total for that period. As a matter of fact most probably r deaths occurred during that period but were erroneously iosed as pulmonary phthisis.

yhow, coming to a later period for purposes of comparison other dangerous trades, I present a table giving the per of deaths per annum for each succeeding year, per sand, engaged in the dangerous branches of the gannister stry :

During	1894	there were	22·86	Deaths from gannister disease per 1,000 workers.
„	1895	„	28·59	
„	1896	„	17·14	
„	1897	„	28·59	
„	1898	„	14·29	

e figure giving an average annual rate of 22·29 per 1,000 ers.

The total number of deaths from gannister disease recorded during the above five years in Stocksbridge-cum-Deepcar was 39. There being thus 7·8 deaths each year on an average.

According to the data I have collected it appears that the mortality rates amongst gannister miners, grinders (including surface quarymen) and brickmakers, differs in the proportions that the following table indicates :

For each 1,000 employed in each group of—

Gannister Miners	each year	...	42·3 die.
,, Grinders	,,	...	179·8 ,,
,, Brickmakers	,,	...	22·2 ,,

Thus it will be observed the mortality amongst gannister grinders is *eight* times as great as amongst brickmakers and *four* times as great as occurs among gannister miners.

The wonder is that men can be induced to work at a trade like gannister grinding where there is the appalling high mortality rate of 179·8 per 1,000.

Let us now see what has been done to try and lessen this fearful sacrificing of human life. So far as I have been able to discover any little efforts which have up to the present been made with a view of preventing this disease are absolutely of no value.

About 1891 a form of oro-nasal respirator was introduced, to be worn by the men—when their masters were watching them! The respirator consisted of an ill-fitting, crudely-made mask of gauze, or perforated metal, to contain a moistened sponge and cover the nose and mouth, and thus charm away the fatal gannister dust. But it was totally unfitted for any such function, even when the workman thought it prudent to wear it.

How could a crude form of respirator remain so close to a man's face—doing such toilsome work as using a pick or sledge-hammer, or shovelling a heavy material—as to prevent dust entering his air-passages? As a matter of fact, few of the men wear their respirators except when doing quiet work, and many of them for convenience have holes made through the gauze to admit their tobacco-pipes!

Again, there is no severe penalty enforced against those who care to work without their respirators.

About five years ago the practice of using steam-jets over the grinders came into use. But cases of gannister disease seem still to occur with the same frequency as before its introduction.

The only other preventive measure I know to have been tried is the sprinkling of water, carried into the pits in ordinary drinking-bottles, where punching for blasting is going on.

ith a view to lessening the mortality from this disease I l venture to suggest that a committee of independent and ssed experts be appointed to investigate the whole subject, o draw up rules to regulate the production and elaboration nnister, the same to be enforced under severe penalties. vould submit to the consideration of such a committee the ving suggestions :—

Only adult men between the ages of 18 years and 60 years d be allowed to work at the gannister trade.

Before commencing work at the gannister trade all such should submit to a rigid medical examination at the hands experienced medical man, and be found to be absolutely rom all disease of the respiratory, cardiac, or renal systems.

All men engaged at working gannister should be medically ined at least every three months, and not allowed to con- work if any evidence of bronchitis (or other affection of espiratory system be discovered). On the disappearance ich evidences they may be permitted to resume work, but ld for six months subsequently be medically examined once nth.

If an efficiently protective respirator can be found, its use ld be enforced under severe penalties.

Frequent inspections should be made of both the surface nderground gannister workings by a capable Government al.

Automatically-acting machinery should be employed where- practicable.

A plentiful supply of water should be produced from a both before and after all processes calculated to agitate

Ventilation should be at all times as efficient as possible.

conclusion, I venture to think I have stated sufficient relating to the dangers of the gannister trade to workers nvince you that the time has arrived when an open and ustive enquiry should be instituted into the conditions r which this trade is practised, with a view to determine ctive measures adequate to make it safe to work at this , if such can be found.

have only to add an expression of my thanks to my friend Robertshaw of Stocksbridge (Yorkshire) for many valuable he has supplied me with. He is at present preparing a r dealing especially with the clinical and pathological cts of the subject of gannister disease. It is for that n that I have entered only so far into the pathology of ister disease as appeared to me sufficient for the informa- of The Sanitary Institute.

CONGRESS AT SOUTHAMPTON
(*Continued*).

CONFERENCE OF MEDICAL OFFICERS OF SCHOOLS.

THE proceedings of the Conference commenced with an address by the President, **CHARLES E. SHELLY**, M.A., M.D., M.R.C.P., M.R.C.S., which was published in the Journal, Part III., Vol. XX.

" *The Treatment of Teeth during School Life,*" *by* S. SPOKES, M.R.C.S., L.D.S.Eng.

I WAS pleased to respond to an invitation to say something about teeth; for my own reminiscences of general medical practice, and what I hear and see of present methods, lead one to believe that too many medical men and others interested in hygiene are inclined to overlook the importance of the condition of the teeth.

Perhaps, it may be well at the commencement of this short communication to say a few words as to the prevalence of caries of the teeth. The various causes of this disease do not, however, come within the scope of my present subject. It must be admitted, I think, that the most common departure from a normal, healthy, condition of the human body is found in the decay of the teeth. Although it was generally known that children's mouths afforded evidence of much decay, it is only within the last few years that the actual extent has been demonstrated. Some seven years ago, the British Dental Association made arrangements for a collective investigation as to the condition of the teeth of children in Poor Law schools, workhouses and reformatories. The following figures refer to an examination of 10,500 English and Scotch boys and girls of an average age of 12 years:—These children had 37,000 unsound teeth. There were 18,000 decayed temporary teeth, more than half of which should have been "stopped." There were 19,000 permanent teeth, 13,000 of which should have been saved, and 6,000 required extraction. Fourteen per cent. had teeth free from decay.

Other observations go to show that higher in the social scale the prevalence of decay is still greater. For instance, out of 560 boys at Haileybury College we found 701 of the permanent teeth were already lost, 1,778 had been stopped, 1,743 required

ing, and that only 13 had sound permanent teeth.
nty-one others had been rendered artificially sound by
ings and extractions.

art from the desirability of securing a hygienic condition
e mouth and teeth from the point of view of the individual,
natter may also be regarded from a national aspect. For
nce, many of the boys in the Poor Law schools go into the
and the Army; and only last year more than 1,700
d-be recruits were refused on account of defective state of
teeth. The authorities can scarcely be considered as
ng high demands, and quite recently it has been decided
the examining medical officers shall be empowered to
n special dental advice when thought desirable, in the
that some of these men, otherwise eligible, may be secured
he Services.

mongst the higher class boys, it is no uncommon thing to
of similar rejections of those seeking commissions. After
xpensive educational preparation, and special coaching and
ming, parents are much surprised to hear that the son has
d to pass his medical examination on account of his teeth
g below the standard required.

ow, much—if not all—of this trouble to the individual and
ace would be obviated by a recognition of the importance
ttention to the teeth during school life. And those whose
ness it is to treat the teeth are unanimous in their opinion
disease can only be prevented and controlled by a
matic periodical inspection of the teeth with the assistance
he dental probe and mirror. It is of no use to wait until
comes as a warning; a tooth that is aching has escaped
best moment for "stopping." Early discovery of a cavity
ecay, and prompt treatment of it, is by far the better method
both patient and operator. The periodical inspection also
vs whether the pupil is doing the best from a prophylactic
ct by a proper use of the tooth-brush, to keep the mouth in
gienic state. There can be little doubt that such inspection
early operations can control, to a very large extent, the
rrence of caries during that period of life when most of the
chief is done. The care of the temporary teeth is also of
h more importance than is generally allowed, and the
ous points which arise in the treatment of irregularity
elf a cause of decay) can only be successfully dealt with by
iodical inspection by the dental expert.

here are some hopeful signs that these demands are being
gnised by those who are responsible for the care and super-
on of Poor Law school children. Already many of the
rds of Guardians have, with the sanction of the Local

Government Board, appointed dental officers, and the latter authority has issued a list of suggested rules for such posts. It has been sometimes argued that the dental treatment of these children should be required of the medical officer; but inasmuch as the great object is to save the teeth by early stopping, and to prevent the necessity of extraction, it is quite obvious that the medical officer cannot be expected to add to his ordinary duties.

Children of the next higher class—*i.e.*, Board school children—are practically left without conservative treatment, and so are in a much more neglected state than the Poor Law children. Some of them, no doubt, obtain hospital treatment, but probably only in the form of extraction. One of the children's hospitals in London—the North-Eastern—has, however, made a new departure. The post of Dental Surgeon is a paid appointment; and last year this officer, Dr. Pare, was able to make 470 stoppings in children's teeth. Some School Boards appear to be moving in this matter, so that before long it is to be hoped that something may be done for these children of the State—for such they have become, no less than the pauper. They are obliged to attend the school, and a great deal is said and written about the necessity of proper feeding for them. But there can no longer be doubt that the large majority of them are not in a dental condition to deal properly with the food supplied, and this leakage in the benevolent schemes propounded can only be remedied by dental supervision.

With regard to the children of a still higher class, they probably require, as I have already intimated, more attention than the others. Their parents, however, are presumably in a position to obtain the necessary treatment for them, provided they know it is required. Probably much more is done than at any former time. As far as girls are concerned, they seem to escape any systematic supervision whilst at school, but at several public schools the boys are treated more favourably. Those who have not received treatment at home are afforded an opportunity of having necessary work done during term by a dental surgeon visiting the school. In some others boys are allowed to go to town, or the nearest centre, if anything urgent warrants it. At Haileybury College the parents of a new boy are asked, amongst other questions, what is the condition of his teeth, and on his arrival a careful inspection of his mouth is made. The condition of each tooth is marked upon a "chart" containing outlines of the teeth. If the dentition is unsound, as is the case in a very large majority, a copy of the chart is forwarded to the parent, with a report from the dentist and a covering letter from the Master, calling attention to the iirements, and requesting that they shall be carried out ore the boy returns next term. Boys are not allowed to e for this purpose during term, but if the parent wishes it treatment can be carried out by the school dentist. The ter is, therefore, quite optional, but the parent cannot d ignorance if anything goes wrong later on. A typical of what sometimes occurs has quite recently come under ce. A boy inspected on arrival two years ago was found to e already lost four permanent teeth and to have five others n commencing decay. The usual chart and report were e, and the next time he was seen it was for pain from an osed pulp in the only remaining molar in the left mandible. ie of the decay had been treated; all the cavities had, of se, increased in size, and another tooth was also affected. was proposing to try for Woolwich in a few months, and n told that he would probably be refused on account of ten and defective teeth, he was of course anxious that everyg possible should be done. His father, a military man, ed his anxiety, but probably will not appreciate the differ- e in time and fees now necessary to accomplish what would e been a comparatively simple and painless treatment two s ago.

n concluding, I would ask members of this conference to st in educating the public mind upon this important subject. dentist sees his own duty in the matter, but for at least reason it is an unpleasant one.

he suggestions I would put before you are—

1) That in all Poor Law Schools dental treatment should be ipulsory.

2) That in Board Schools it should be at first optional, and r on obligatory.

3) That in public and private boarding schools there should compulsory inspection on arrival, with reports to parents en necessary. Treatment here would, of course, be optional, parents should be requested to arrange for periodical ection and a visit to the home dentist in sufficient time ore the end of vacation to allow for any treatment essary.

4) That for all scholars the use of the tooth-brush after the meal of the day should be enforced.

he **CHAIRMAN** (Dr. T. Whitehead Read) said he had sons at a lic school, where the same kind of things happened as had been ntioned in the paper. He thought the suggestions would be very e if they had a surgeon-dentist appointed to each school who uld be responsible for the work done. At this particular school there was no dentist attached, and the boys were sent right away from the town to a neighbouring village to a dentist who was not a member of the College and who did the work. It was a disgrace, he thought. It would be a great safe-guard to have something carried out with regard to dental supervision. This was a very good suggestion.

Dr. **Arnold C. Ingle** (Cambridge) said that much suffering was caused to young people because of shameful neglect in the matter of their teeth. In his own school he had been for some little time trying to get a dentist appointed who should inspect the teeth of all the boys. The matter was first brought to his attention by Dr. Spokes himself, in connection with the School Dentists' Society. To his mind it was a very suggestive address, and opened his eyes a good deal to the possibilities they might have of checking this evil among boys. He felt that what was wanted was not so much compulsory action on the part of schools, which was not so easy, as that the public generally should be educated to see the importance of the question of teeth. In the present state of things, if they appointed a school dentist and charged the boys additional fees to pay the dentist—as was willingly done now for the school doctor—a number of the parents would say it was not necessary if the children were not suffering. The method of sending votes recommending what should be done might be a step in that direction, and if it only led to teeth being properly seen to they would all feel that the boys' future would be made happier and more healthy in every way.

Dr. **W. Gripper** (Wallington) said one difficulty was to attach responsibility to what he might call the medium grade schools, such as orphanages and others of lower grade, especially female schools. In one such case they had a dentist attached to the school, and he came a considerable distance. He was supposed to visit perhaps once a quarter. There ought to be a regular dental surgeon in the neighbourhood attached to the institution, to whom the cases could be sent. Not a single child had been sent in ten years. If one was in pain, a tooth was removed if the dentist had time, or if not, next time. But it was very unsatisfactory. But, as was said just now, the difficulty was to get committees to realise the importance of anything to do with the teeth of the children. It was not always feasible to get the dental surgeon to visit as required, nor to have any large remuneration; but if at a reasonable distance, children could be sent for stopping or extraction, and he should come once a month or so to examine them. It was most important that girls who had to gain their own living, and were mainly dependent on their good health in so doing, should have as much care as possible paid to their teeth in their earlier years.

Mr. **T. C. Turton** (Goole) said he quite thought if it was obligatory at certain times to look after and inspect the teeth of children in schools it would also have a great educational effect on the whole of the public with regard to the care of the teeth, and therefore with regard to health. He found in practice that in 90 out of 100 words "Too late" might be said of cases brought for inspection e profession. What might have been done very easily if attended the proper time, with very little trouble and pain to the children, often to be effected at the cost of considerable suffering and nce, and in many cases had to be left in an unsatisfactory conn. Therefore he thought this a very important question, and it need not be a very expensive one, although so necessary.

r. S. **Spokes** (London), replying on the discussion, said the rks they had heard that morning should gratify all who had subject at heart. He had condensed as far as possible in his t communication, and therefore did not venture to allude to e difficulties which Dr. Ingle appreciated as to the question of It would be very nice if in some cases dental appointments d be made almost analagous to that of the medical officer. But he thought was quite impossible, and they must be satisfied a less settled scale. It was a great thing, as Dr. Ingle said, parents should be warned, and they could not then be ignorant wards when trouble came either in connection with the army or Services. If the responsibility was fixed upon the parents by ematic examinations and reports by the school dentist, he thought ould be a very great thing. Parochial authorities and metropolischools were rapidly making such appointments. Suppose they £100 a year for attendance by a dental surgeon for five hours a k regularly, it was surprising what could be done.

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he best means available in Public Schools for the Prevention of Infection through the Milk Supplies," by CHRISTOPHER CHILDS, M.A., M.D. Oxon., D.P.H.

(MEMBER.)

the light of modern experience the desirability of protecting k supplies from contamination with infectious or deleterious terial will be admitted by all those who have carefully died the matter.

serious responsibility and duty therefore devolves upon the ent or householder to protect the members of his household m the preventable maladies which may be conveyed through k; still more so upon the schoolmaster to protect the pupils ler his charge; and equally upon the medical officers of ools, to whom the masters look for guidance and advice for prevention of disease.

Moreover, it is imperative that that protection should be de as complete as possible with the aid of our present entific knowledge, and by means of such administrative asures as are available.

In order to give definite aim and limits to our discussion, I venture, with your permission, to bring before you the following propositions:—

Proposition 1.—It is incumbent on Authorities having control over schools in which milk is supplied to the pupils to take all reasonable precautions in order to prevent the milk from being contaminated.

For this purpose the following Regulations are necessary:—

(A) The cowsheds, dairies, and premises of the farm from which the milk is supplied shall be inspected and regularly supervised by a Medical Officer of Health, and kept in good sanitary condition.

(B) The cows shall be frequently and regularly inspected by a competent Veterinary Surgeon, and tested by tuberculin; guarantees being given that any cow in which he detects tuberculosis or any other malady by which the milk may be rendered noxious or deleterious to health, shall at once be removed from the herd; and that no milk from such a cow shall be supplied to the school.

(C) Guarantees shall be given by the Vendor (1) that no one suffering from infectious disease shall be employed or come in any way in contact with the milk, milk-vessels, or places where the milk is stored; (2) that when any case of infectious illness occurs upon the farm or amongst those employed in connection with the milk supplies, or in the families of those so employed, notice thereof shall at once be sent to the medical adviser of the school.

(D) Arrangements shall be made by the school authority to pay reasonable compensation to the milk vendor for any losses which he may incur in carrying out the regulations stated in the above clause (C).

Proposition 2.—In cases where the above regulations and precautions cannot be systematically carried out, all milk and cream supplied to the school should be either boiled or "Pasteurised."

Proposition 3.—Prevention of contamination of the milk is decidedly preferable to counteracting the contamination by heating, boiling, &c.

Evidence from which it is concluded that such precautions and regulations are needed in order to protect the milk supplies.

It is generally admitted that various infectious diseases may be, and actually are frequently, conveyed by milk, *e.g.*, scarlet fever, diphtheria, diarrhœa, tuberculosis, and typhoid fever.

This opinion is based upon and corroborated by numerous rts by Inspectors of the Local Government Board, Medical ers of Health, and others; especially—

) Those Reports, summarised by the late Ernest Hart, of utbreaks of disease traced to the agency of milk in his r read at the International Congress of 1881; and of 95 reaks of sore throat, diphtheria, scarlet fever, and typhoid which were traced to the milk supply between 1881 and (British Medical Journal), the Report by Dr. Davies on outbreak of milk borne enteric fever in Clifton" (1897).

) Report of the Royal Commission on the effect of food ed from tuberculous animals on human health (1895).

) Numerous Reports, Lectures, &c., published during the few years by which it has been shown:—

) *That tuberculosis is very common amongst our milch cows.*
Out of 300 slaughtered at Edinburgh 120 were tuberculous, *i.e.*, 40 per cent.
In Lord Vernon's herd, 45 per cent.
In Lord Spencer's herd, 23 out of 23, *i.e.*, 100 per cent.
At the Queen's Home Farm, 36 out of 40, *i.e.*, 90 per cent.

) *That virulent tubercle bacilli are to be found in a large proportion of our milk supplies; e.g.*,
At Liverpool, from city sheds, in 12 out of 228 samples, *i.e.*, 5·2 per cent.
At Liverpool, from country sheds, in 9 out of 67 samples, *i.e.*, 13·4 per cent.
At Manchester Railway Stations, in 17 out of 93 samples, *i.e.*, 18·3 per cent.
At Cambridge (supplies to Colleges) in 9 out of 16 samples, *i.e.*, 56·2 per cent.

) *That Tuberculosis is frequently communicated from cows to human beings through the milk.*

4) Reports by Klein, Andrews and others indicating the sional presence of the Bacillus Enteritidis Sporogenes in as a cause of outbreaks of diarrhœa.

5) The fact that milk serves as a very suitable culture lium for pathogenic bacteria (*e. g.*, those of typhoid fever), vell as for bacteria generally. (Consequently it is probable t milk may often act as a fertile medium for the growth and vection of those infectious germs already mentioned as well thers.)

low may the precautions and regulations for the protection of ool milk supplies be carried out?

low far can we trust to milk vendors or to local sanitary horities to secure the proper sanitary conditions of cowsheds, dairies, etc., to exclude all chances of infection from human beings; to separate and remove all cows affected with infectious diseases, such as tuberculosis, or those ill-defined maladies which are accompanied with eruptions on the udder?

It is a matter of congratulation that there are some milk vendors and dairy companies who employ an ample staff of medical officers, veterinary surgeons and inspectors, with whose aid all the regulations suggested above are carried out. Such establishments set an example which should be followed in all parts of the kingdom. Such establishments, however, are rare and quite the exception. There is abundant evidence to show that filthy and insanitary cowsheds and unprotected dairies are common everywhere, that persons are frequently employed in milking, etc., whilst they are in infectious condition, that polluted water is very commonly used for cleansing milk vessels (and not infrequently for adulteration) and that a large proportion of the milk supplied contains living, virulent, tubercle bacilli.

Protection by Local Sanitary Authorities.—The Dairies, Cowsheds, and Milkshops Orders of 1885 and 1886 impose upon all Sanitary Authorities the duty of supervising the milk trade in their districts, and also confer the optional power of making regulations similar to those suggested above, for the inspection, supervision, and control of dairies, cowsheds, milkshops, &c.

It must be admitted that in some places great improvements have been made through the action of Sanitary Authorities in the conditions and management of the milk-supply. On the other hand it is notorious that, owing to ignorance, prejudice, indifference, and vested interests, the supervision and protection of the milk supplies is grossly neglected by many Authorities.

Moreover, there are serious defects in the existing laws, through which the protection of our milk supplies is rendered very imperfect, viz.:—

(1), the power to make the necessary regulations is quite optional, not compulsory, and therefore frequently neglected.

(2), the penalties incurred through breaking the orders are too small to be deterrent.

(3), the control and supervision of the milk supplies by a sanitary authority do not extend beyond its own district.

(4), the provision made in the clauses dealing with the milk supplies in the Infectious Diseases Prevention Act (1890) is a solemn farce, devised in such a way as to stop the delivery of an infected milk supply some time after that supply has communicated its poison to those who drink it.

The schoolmaster, therefore, like other individuals, cannot trust to the milk vendor nor to the sanitary authorities for the adequate protection of his milk supplies. But, fortunately for he can take the remedy into his own hands by contracting the milk vendor that the milk shall be supplied under lated regulations and guarantees. Contracts of this kind been made by some of our large hospitals, and it is most able that similar conditions should be insisted upon by all ic institutions to which milk is supplied. It would be of t interest to learn which of our public schools have adopted system for the protection of their milk supplies, and how t acts satisfactorily.

think everyone will agree that it is by far the best plan to ent contamination of milk, rather than to correct the results ntamination by Pasteurising or boiling. In some schools, ever, it may be impossible to secure the necessary supervision, ction, and guarantees. In such cases the only remedy is r to boil or to "Pasteurise" the milk. (The term steurising" has come into common use and is generally ied to the process of heating the milk to a temperature of or 70° C. for thirty minutes).

oiling the milk even for a few seconds, we have been red by the Royal Commission on Tuberculosis, will destroy tubercle bacilli which may be in it. The germs of diphia, typhoid fever, and cholera are destroyed at much lower eratures.

must be remembered however that sporogenous germs may be destroyed by boiling even for some time; and, if we pt the conclusions of Klein and others that the bacillus eritidis Sporogenes may occasionally be found in milk and rise to outbreaks of diarrhœa, we must admit that neither eurising nor momentarily boiling the milk will protect the umers from such outbreaks.

regard it as very unfortunate that the processes of boiling Pasteurising have come to be regarded as equivalent to rilizing"; and many persons who speak as authorities use terms as if they were practically synonymous. Ordinary 's milk, as delivered to the purchaser, can only be sterilized certainty by boiling for several hours, or by heating to a perature considerably above boiling point for several minutes, y fractional sterilization (*i.e.*, heating to boiling point,—for half an hour—on three days in succession), or by some r means of powerful disinfection. All such measures would ler the milk unpalatable and unfit for food.

o what degree milk should be heated (short of boiling point) for what length of time in order to destroy the disease ns which are generally supposed to be conveyed by it has yet been accurately and finally determined.

he most important point to be decided is at what temperature the tubercle bacillus is destroyed in milk in a given period of time. For that bacillus is the only one of the infectious germs which is commonly found in milk, and it has been shown that the germs of diphtheria and typhoid fever are destroyed at considerably lower temperatures than the tubercle bacillus. A very large number of experiments have been carried out in this country, in Germany, America, &c., in order to decide this death-temperature of the tubercle bacillus.

According to the report of the Royal Tuberculosis Commission (1895), Sims Woodhead, "as the outcome of his numerous experiments tells us that sterilization towards tubercle bacillus can be effected by heating the milk in a water bath, continuing the process until the temperature has risen from 80° C. to 92° C." (176° F. to 197·6° F.). The Commission, however, were not convinced that this high temperature was sufficient to ensure the destruction of the tubercle bacillus, and preferred to render it absolutely innocuous by boiling. Some of the ablest German bacteriologists, however, have concluded that a temperature of 70° C. (158° F.), for fifteen minutes, is sufficient, whilst others have been content with even lower temperatures.

Recently Theobald Smith (Jour. Exp. Med., March, 1899), has completed a long series of experiments, from which he concludes that tubercle bacilli, when suspended in milk, are destroyed at 60° C. in fifteen to twenty minutes, but that the pellicle which forms during the exposure at 60°., may contain living bacilli after sixty minutes. He considers that this pellicle which forms during the heating of milk, shields the bacilli from the effect of the heat, and that the irregular results produced in experiments made for determining the death temperature of tubercle bacilli in milk may be explained in this way. This continued uncertainty with regard to the death-temperature of tubercle bacilli in milk emphasises the opinion of the Royal Commission that boiling the milk is a safer measure for general use than the process of so-called "Pasteurisation."

Another most important argument in favour of protection of the milk supplies—as compared with boiling and Pasteurising—is the fact that cream prepared from tuberculous milk may contain tubercle bacilli even in larger quantity than the milk itself.

The careful investigations, which were made by the late Professor Kanthack and Dr. Sladen, of the milk supplied to various Colleges at Cambridge ("Lancet," Jan. 14th, 1899), showed that in six out of the 16 samples examined, the milk separated from the cream by centrifugalisation contained living virulent tubercle bacilli, whilst in nine out of the sixteen samples cream so separated contained the same bacilli in equal or ι greater quantity. Moreover various bacteriologists have ᴦn that the presence of living virulent tubercle bacilli is not ll uncommon in ordinary butter; nor is there any reason for ›osing that tubercle bacilli, or even the other infectious ns which may occur in milk, would be destroyed in the esses of preparing cream or butter unless the milk has been led or kept at a high temperature for some time.

; is obvious therefore that cream and butter are liable to :ain infectious germs as well as the milk from which they e been prepared (unless heat has been used in the process), that it is just as necessary either to Pasteurise or to heat to ° C. both cream and butter unless all reasonable precautions e been taken to exclude contaminated milk.

n a Conference of Medical Officers of Public Schools, I feel fident that little or no argument is required to prove the essity of protecting our school milk supplies. I hope, ;ever, that the details which I have brought before you may freely criticised, that any weak points in them may be rected or supplemented, and that we may have some valuable gestions from those who are best qualified, from their ctical experience, to speak on these matters.

trust that I have put the facts, arguments and conclusions ·ly before you, and that a clear statement of the dangers nected with our milk supplies, and of the means by which se dangers can be prevented, may be impressed upon parents, vell as upon those who have children and young people under ir charge, in every part of the kingdom.

Finally, as I am aware that the Association of Medical icers of Schools have done most excellent work in formulating es for the prevention of infectious diseases in schools, I iture to propose:—*That this Conference begs to appeal to the uncil of the Association of Medical Officers of Schools to take ler consideration the protection of school milk supplies, and, if y approve, to draw up a code of detailed recommendations for : purpose.*

The **CHAIRMAN** (Dr. T. Whitehead Reid) said he remembered his n school when they had a threatening of diphtheria, called diph-:ritic sore throat. At first he declared it necessary to boil all the :k. The boys drank it for about a week and then fairly struck. ıen they tried to save the difficulty by adding cream, of course that ıs worse than useless. It was a mistake altogether and they had go back to pure milk and run the risk. He thought Dr. Childs d raised a very important point in regard to the supervision of the ılk supply. So very often the milk came to them from so many different sources that it was almost impossible to exercise control. But he thought if the head master was impressed with the importance of having only one source the control would be better. Another point was the chemical matter, which he hoped would be fairly discussed.

Dr. W. C. C. **Pakes** (London) said the question was one of boiling as opposed to Pasteurisation in regard to safety. There were two or three methods which could be used to sterilise milk. The first was to boil milk over a fire, the second by steaming at 100° C. or a little higher, the third by Pasteurisation. The great objection to the first method had already been pointed out, and no doubt milk boiled in a saucepan was to most people objectionable. The second method, that of sterilising with steam, had, fortunately, not this objection. A variety of sterilised milks were sold, and the milk put up in bottles was, if done properly, actually sterile, and it had not the objectionable taste which milk boiled over an open fire had. This plan in schools where they had steam power was merely a matter of arrangement. The third method, that of Pasteurisation, was supposed to have certain advantages, one of the chief being that it did not decrease the nutritive power of the milk as sterilising at a higher temperature was said to do. The question had still to be settled as to the temperature, time, and number of times of heating necessary to thoroughly sterilise milk by this method. Fortunately for one thing there were not many pathogenic organisms in milk which had been submitted to some process of sterilisation, for these organisms were as a rule easier to kill than some of the spore-bearing organisms. There was one point against the success of Pasteurisation. Even if milk were heated for several minutes to 80° or 100° it was not necessarily sterilised. The reason for this he thought was not that spore-bearing organisms were necessarily present, but that the emulsion and cream in some way prevented the heat from getting to the bacteria. He stated the result of some recent experiments he had made. One, two, or three minutes at 100° C. did not sterilise the milk, but when it was diluted with an equal quantity of ordinary sterile broth and heated to 80° C. for the regulation half-hour, in which case everything but spores would be killed, he found the milk absolutely sterilised. His experience, therefore, was that it was safer to raise to 100° C. by steam than to trust to imperfect Pasteurisation, but that if it were possible to keep the milk for the time necessary for efficient Pasteurisation, this would probably be found the best method, because of the greater value as a nutritive agent. As a commercial scheme, however, he doubted whether it would be possible to sell sterile Pasteurised milk.

Dr. J. F. **Whittingdale** (Sherborne) said that no doubt the best preventive was to go to the source. If you could depend upon the cowsheds it would prevent the necessity of sterilising, and would be far the best; but when one saw the dirty way which dairymen set to work to milk cows, never taking the trouble to wash the udders or wn hands, one saw that it was very necessary to adopt some d of sterilisation. Personally, he believed in boiling, he had insisted on it at the school with which he had been connected, did not find the difficulty about boys disliking the taste, it was er of getting accustomed to it. In his own family he always e milk boiled for his four children, and they were all very y and liked the milk. There was no doubt boiling was very more likely to be done in a large establishment such as a school, terilisation, which took half-an-hour, and was a lot of trouble. mpler the means the better, and the more likely to be carried

W. J. **Abel** (Nottingham) remarked that he only wished to e or two words on the general question of inspection versus pted sterilisation of milk. He believed most heartily himself hey should go to the root of the matter, that they should in season and out of season for a proper inspection of , &c. The natural method of taking milk was certainly in w state. It seemed to stand to common sense that the milk be more digestible in its unboiled state, of course there lbumen in it, and heating tended to make albumen more stible. Milk was one of the natural foods, and was prepared igestion in its raw state, therefore they ought to try so to e that young children, to whom a milk diet was most im- t, could take it in its natural state. Then, again, it was very ful if the sterilisation of the milk was real or largely illusory, ther people should choose the method of continued boiling, or rely bringing the milk up to the boiling point. As to the filth friend spoke about, of course boiling might do a little to remedy il, but it could not remove the filth or its nauseous associations. ction, and insisting upon greater cleanliness of cowsheds and ng arrangements were certainly better preventives of the evil receiving the filth and cooking it afterwards. At the Birming- Conference last year something was said on the subject, he ht then, and he felt even more strongly now, that they ought to for inspection of cows and cow sheds. If large schools and rations would be earnest in this matter he thought they would soon secure definite action in the direction sought.

. **Arnold Ingle** (Cambridge) said the resolution which was ntly to be put to the meeting was one which he was sure would nend itself to all of them, and he sincerely hoped it would ve the attention it deserved from the Council of the Association. difficulties, of course, were very much greater, as had been ted out, in those schools which were dependent upon a public ly for their milk, and very much smaller in the case of those had their own dairies. The latter, no doubt, was the arrange- t that should obtain in public schools. He was thankful to say in his own school they had their own dairy. But still there schools that could not have their own dairies, and they had also to consider the question of milk supply in private families, and the best means of dealing with that. The difficulties of boiling had been referred to, and they were very great. Though, on the one hand, Dr. Whittingdale thought children did not object to this boiled milk, he thought most of them agreed that generally children did. Then they would remember there were means of attaining their end by apparatus in use, and which were said not to alter the taste of the milk. He had tried them, but although the taste was not so pronounced as in the case of boiled milk, yet it was there as a rule. Were they to run the risk of their not drinking it, or of being cut off from one of the most important food supplies for young people? There was another question, perhaps more important, and that was whether the nutritive qualities of milk were in any way altered by means of being boiled in this way. Perhaps little children—infants, he meant—did not notice the alteration of taste, not being used to the other, and would take it, but to his mind, where they protected them from one danger they exposed them to another. An opinion on that point would be a matter of very great interest. Another question he wished to ask about was spores—whether, supposing the milk was subjected to the same process which would kill germs, was there any danger from spores which might escape the germ test.

Miss **Ethel Newcombe** (Southampton School Board) said, in referring to difficulties concerning efficient inspection, that under the present method of supplying milk it was only too easy to evade the law, which in rural districts was rarely enforced. She would like to suggest that as they had in many towns a municipal water supply, there seemed no reason why they should not municipalise the milk supply, which was even more important. It would mean the prevention of many evils, and they might at the same time have inspection more thoroughly carried out.

Dr. **Christopher Childs** (London), speaking in reply, said he presumed he might conclude from the general drift of the discussion that the three propositions, as well as the resolution, which he had brought forward were accepted by the meeting. The first and third propositions, viz., "That it was the duty of school authorities to take all reasonable precautions to prevent contamination of the milk rather than to trust to the processes of boiling, scalding, or 'Pasteurization' for its purification," he regarded as very important. To private individuals it might be very difficult to make sure that such precautions were constantly and systematically taken, unless they obtained their milk from one or other of those companies which guaranteed a constant and systematic supervision of their milk supplies, the exclusion of milk derived from any but healthy cows, and the prevention of contamination of the milk with infectious material by all available and practicable means. In schools, however, and in public institutions where large supplies of milk were required, the management had the advantage of being able to make terms with the milk vendors, and to obtian such guarantees that the milk supplied

be protected from contamination in the same way as by the
nies previously mentioned. With regard to the second propo-
viz., "That where the precautions required for preventing
nination could not be carried out, all milk and cream supplied
school should either be boiled or 'Pasteurised,'" there were
erious objections. Amongst others, was the boy's dislike for
milk, mentioned by a previous speaker, a practical difficulty no
but one which could be and was overcome in many families
hools. A more serious objection was the fact that we could
at all certain whether boiling, scalding, or "Pasteurization"
be depended upon for destroying all the infectious germs
were liable to occur in milk. Persons—even persons who
d to speak with authority—constantly spoke of these pro-
as processes of "sterilization." He wished to repeat most
tically that these processes did not of necessity sterilize milk.
true that boiling and "Pasteurization" (if conducted at a
rature of 70° C for thirty minutes) destroy nearly all the
s micro-organisms which are usually to be found in the milk as
ed to customers. They would also destroy the specific germs of
d fever or cholera if the milk had become contaminated with
germs. But they would not destroy the "sporogenous"
-forming) bacteria such as the "Bacilli Enteritidis Sporogenes."
siderable amount of evidence had been brought forward during
st few years indicating that these bacilli—the "Bacilli Enteri-
Sporogenes"—occurred not infrequently as a contamination in
nd as a cause of outbreaks of violent diarrhœa. It should not
t sight of that such outbreaks would probably not be prevented
iling or "Pasteurizing" the milk in the ordinary way. Again,
is still some uncertainty as to whether the tubercle bacillus, so
ntly occuring in milk, is actually destroyed by "Pasteurization."
Royal Commission on Tuberculosis (1895) accepted the evidence
"the tubercle bacillus is destroyed by boiling for an instant
"; but authorities still differ as to the degree of temperature to
milk should be raised and the length of time during which it
d be kept at that temperature in order to ensure the destruction
bercle bacilli if they happened to be present in the milk. This
ion was still *sub judice*. Most authorities, however, had agreed
by "Pasteurizing" milk at 70° C for thirty minutes such bacilli
d be killed. A lady had suggested municipalising the milk supply.
hould be quite ready to assent to that when they could establish
ct Municipal Government. He ventured to point out that the
ary authorities in so many districts constantly neglected to exer-
the means and power which they already possessed to supervise
control the milk supplies.

iss **Newcombe**: It has been done in the case of water, and with
t success. Why not in the case of milk?

r. **Childs** replied: That might be true with regard to water, but
protection of water supplies was not so complicated a matter, nor
t interfere so much with vested interests. With regard to the

resolution proposed, he trusted that the suggestion would not be regarded as dictatorial. He was aware that the Council of the Association of Medical Officers of Schools had done most excellent work towards formulating regulations for dealing with infectious illnesses in schools, and it would be a great boon if they could do the same in regard to milk.

The CHAIRMAN (Dr. T. Whitehead Reid) then proposed the following resolution:

"That this Conference begs to appeal to the Council of the Association of Medical Officers of Schools to take into consideration the protection of school milk supplies, and if they approve, to draw up a code of recommendation for this purpose."

He thought that after what they had heard it seemed a very reasonable one and ought to be carried.

The resolution was then put to the meeting and carried unanimously.

"*Announcement of the Examination in Practical Hygiene for School Teachers,*" *by* H. R. KENWOOD, M.B., D.P.H.

(FELLOW.)

Dr. KENWOOD wished to take this opportunity of announcing a matter which he knew would be one of great interest to that Conference. It was that the Sanitary Institute had decided to hold a special examination, and to grant a qualifying diploma upon the subject of hygiene for school teachers.

The question was constantly being asked as to why it is that in our system of education, the one subject of which the student is taught practically nothing is the vital and essential one of the laws of health. It may also be asked whether it is not anomalous that those who have the charge of children and who are largely responsible for the healthy training of those children assume those grave duties without any knowledge of those sanitary principles which when put into practice will serve to ensure that healthy mental and physical developement which is of more importance than all other education.

The general public, and with them the school authorities, are now beginning to recognise that there is no sufficient answer to these two questions, and that it is a reflection on our system of education that any such questioning is possible.

Teachers are far more valuable in their educational efforts if they are able to apply and inculcate the simple laws of health among their scholars, and in his opinion it would not be long before teachers would be judged as unfitted for their post if

l not possess a recognised certificate of hygiene in its
upon the scholar and school-life.
teachers recognising the importance of this knowledge
irous of fitting themselves for their duties, by under-
the necessary work and presenting themselves for
tion, and this voluntary effort is very commendable.
ed and believed that in the near future the acquisition
knowledge would not be left to voluntary initiative.
Kenwood then fully explained the scope of the work
would be required of those who obtained the certificate
Sanitary Institute, and he gave information with
e to the arrangements which had been made for
the examination.

REDERICK JENKINS (Middlesex C.C.) said he took it that the
tion in hygiene foreshadowed by Dr. Kenwood would differ
from that held by the Science and Art Department in this
at present. Great prominence had been given to the subject
ne in the county of Middlesex and especially in Tottenham,
very large population, where very successful classes in that
had been held, the students being mainly teachers under the
am School Board and the voluntary schools. Out of a total
f 33, 22 sat for the examination, which spoke very well for
ey, the teacher. The County Council of Middlesex attached
mportance to the subject, and when the syllabus was out he
o see a copy of it.

ABEL (Nottingham), said he gathered it was intended to
he examination much more practical than that of the Science
rt Department. That was very well but not enough. As
nkins had mentioned about the teachers in elementary
, he was able to state that the teachers of the Nottingham
tary Schools paid very great attention to hygiene on the
and art side, and also to its application in the matter of a
nursing course for girls and ambulance work for boys. His
end, Surg.-Major Hutton, had a great deal to do with the
ation in the ambulance classes in question. There was how-
great absence of *practical* knowledge of the subject. In one
examinee was asked, "How would you treat a case of wound
head?" and replied that he would apply a tourniquet,—put a
erchief round the patient's neck and twitch it tight with a
This would cure certainly; but he thought the remedy would
too effective. He had personally found teachers who had
the St. John's Ambulance Examination, very helpless in cases
ious accidents in schools. What they wanted was still more
cal instruction, and he personally would hail with great satis-
n anything which would assist them in this matter, whereby
night have more confidence in their teachers being able to give

efficient first aid in school accidents and diseases. He thought however that the elementary schools in the country were even now very much in advance of the secondary and higher schools. He considered the proposal in question an important step in the right direction.

Dr. HENRY KENWOOD (London), replying said that there had been a considerable amount of time spent and trouble taken in the drawing up of the Syllabus. They would see that it was arranged on a carefully-thought-out system, and gave much information as to the nature and extent of the knowledge required, and of the special books which it would be necessary for the candidate for the examination to consult. He had been asked if this examination by the Sanitary Institute would be on the lines of the Science and Art Department, or whether it would differ in any material respect. He might say that the Council of the Sanitary Institute had taken the view that, useful as the examinations of the Science and Art Department were, the scope of these examinations did not cover all the ground which it was proposed that the examination of the Sanitary Institute should cover. What they wanted was that school teachers should possess a thorough practical knowledge of so much of hygiene as affected the scholars and their surroundings. It would be made a very practical examination. Questions would be asked which it was judged essential that those who had the charge of children should be able to answer—not only from book knowledge, but from actual observation also. Matters of municipal hygiene would not be dealt with, nor would those which did not relate to the health of the individual; the candidate would, however, be examined upon hygiene considered comprehensively in all its bearings upon school life. It had been asked whether at the same time that they proposed this scheme for the protection of children anything would be done for the parents. Well, a great deal had been already done and was still being done for parents by the Sanitary Institute. He took it that such a Congress as the present one was a considerable educational factor for adults, and the Institute was constantly engaged in disseminating a knowledge of hygiene among the general public, and in training both sexes for the important duties of putting the principles of sanitary science into actual practice. The view which he held was that the most effectual mode of procuring a more general observance of the laws of health was to deal with the infant, and thus graft principles upon a mind which was plastic and receptive, so that these would grow into the individual as it were. These children would soon grow up to be parents, and they would then practice what had become impressed upon them in their early lives. Moreover, it was extremely difficult to educate parents as a body. They were for the most part inaccessible. The only people who generally came for instruction were those who least required it, and most adults had already acquired fixed ideas and habits, which it was difficult to correct.

dvisable to Allow Junior Boys to Compete in Long ance Races"? by J. F. L. WHITTINGDALE, B.A., ., M.R.C.S., Medical Officer of Sherborne School.

ABSTRACT.

atter has attracted the writer's attention for some
d was first brought to his notice by the occurrence of
s pointing to heart strain in the case of two boys
nning in the junior steeplechase, over a course about
a half miles long. This race is limited to boys under
ears of age. Before competing they were both strong
thy, good at games, and with no symptoms pointing to
ction of the heart. However, shortly afterwards, they
d pronounced symptoms of heart strain, as shown by a
y to palpitation, dyspnœa, and faintness on the slightest
nt or exertion, which rendered them unfit for games,
n school work, for some considerable time.

a view to forming some idea of the relative frequency
ich such symptoms occur in boys after this race, the
xamined all the boys who ran in the last junior steeple-
after an interval of over three months had elapsed.
tion and a tendency to faintness were complained of by
ys as coming on without apparent cause, and similar
ns were noticed after running by three others. Signs
g to slight hypertrophy of the heart were present in no
n eight cases.

quotes a case mentioned by Gibson, where a schoolboy
ed cardiac dilatation with incompetence of the tricuspid
hilst training for the school sports, and also Da Costa's
f irritable heart developed in a number of young soldiers
the American Civil War, owing to being suddenly called
edentary occupations to active service, involving long
s and hardships, without any preliminary training.

r pointing out that a good vital capacity and especially a
heart are required in prolonged contests, he cites the
les of some celebrated animals, noted for endurance
than speed, which possessed exceptionally large hearts.
en shortly discusses the views held as to the pathology
condition known as "heart strain."

ing that during the period of most active growth, the
is more liable to strains in its different members, and
bly organs also, and if we take Maclaren's tables of the
ge growth of boys at the different ages as approximately
t, in which he finds that the most rapid growth occurs

between the ages of thirteen and fifteen, being only slightly less between fifteen and seventeen, after which age it is usually finished; the writer concludes that it is manifestly unwise to subject boys at this delicate period to such severe strain as is involved in long distance races. He therefore thinks that an age limit should be fixed, and that no boys should compete before they are seventeen, and then only after a careful preliminary training, carried out under competent supervision.

The **Chairman** (Dr. T. Whitehead Reid) said it was really wonderful that in such a short distance as two and a half miles for juniors he should have observed these cases. At the school he was at they went ten miles, and whether they were twelve, fifteen, or seventeen, there was no consideration at all, and those who could not keep up fell out. The result was extremely disastrous. He saw a young lady the other day playing tennis very hard with her young brother, who was back from school; she was not in training and her heart was dilated, and she was suffering from excessive tennis playing. No doubt the matter of heart strain was very important, and must have a notable effect in a large school where they ran races too long.

Mr. W. J. **Abel** (Nottingham) said he had seen the immediate results Dr. Whittingdale mentioned follow races which one would perhaps characterise as short distance. It seemed to him that a great deal depended on how the individual scholars had been trained. The physiological effects of half-mile races might be very serious for a runner who was not in proper training, but not at all serious for a boy of similar age running even two or three miles, if he had previously been in carefully graded training. Only a few weeks ago he was acting as judge in some school races where the scholars were running, he believed, some up to a mile, and he was most pained to note the grave signs of strain in some of them at the close of the race. He could not subject them to exact examination at that time, but he was quite sure there was most serious heart strain. In one or two cases there was faintness almost amounting to unconsciousness for a time. He thought then, and this paper had strengthened the opinion then formed, that perhaps it would be well to issue rules that in the absence of special evidence of previous training, and fitness, these long races should be forbidden to young pupils. The practical point before them was, what could be done in order to minimise the evil brought before them that morning. Were they to set down certain distances to be called long distance races for boys of given age, and were they to forbid boys of that age from exceeding these limits? or were they to adopt another course, and say they would not allow boys to go in for races of more than a certain distance unless they had had previous carefully graded training, and in the course of such training had not shown marks of special fatigue from heart strain? He preferred the latter alternative.

Lockhart Gillespie (Edinburgh) said that one thing had
i especially—compulsory runs at school when football was
. The boys were given a fixed point to run to along
oads, whether they liked it or not. If football could be
ery boy, unless certified unfit for it by a doctor, had to
Now, boys who found pleasure in these forms of exer-
they were the majority—benefitted from them; those who
iem, he was sure, received more harm than good. Physical
onferred much more benefit on the organism when accom-
th mental pleasure and active interest, especially in the
The choice of games allowed at most schools was too
it was folly to say that football must be played by all,
itted or unfitted for it by physique or temperament. Most
oys enjoyed the game, the few who were constitutionally
ost more than they gained in this endeavour to harden
t school race meetings one found only those boys competing
especially proficient at the various sports; no compulsion
ed. Was a hard game of football less onerous than a mile
xercise in the fresh air was always beneficial and should be
n, but the form exercise takes ought to be varied, so that
est good might accrue to the greatest number. Another
onversely, lay in the encouragement of boys who showed
roficiency in gymnastics, football, or in running, to overdo
and training, in the hope that they might enhance the
f the school, or of some separate division of it, by their
performances. Over-exertion on these lines in youth
y led to heart troubles in the future. School athletics
e much more strictly governed, and when applied compul-
vays with a proper regard to the individual, not with the
every boy was but a member of a uniform genius, with
powers.

hristopher Childs (London) thanked Dr. Whittingdale for
these careful and valuable observations. He thought they
eware of overburdening growing youths with too many
ons with regard to the age at which they should begin
and the extent to which they should indulge in them.
had to deal with physical as well as moral and intellectual
n. The heart circulatory apparatus required well-regulated
and training for their proper development. By restricting
exercise too much they might defeat their own object and
such development. Individual experiences and opinions
on generalisms were of little value when compared with con-
drawn from such careful observations as those which Dr.
gdale had recorded. Such experiences and opinions however
ot without their value. In his own school athletics of all
vere carried on to an extreme. Boys of all ages—from
st to oldest—were encouraged in every way to enter into all
mes and athletic sports. Subsequently he had the medical
sion of the same school for six years, during which time any

ailment which occurred among the boys was immediately reported to him. Neither as a schoolboy nor as a medical officer could he recall a single case in which there was evidence of overstrain of the heart. But he would point out that in this school there were no races which would throw a prolonged strain upon the heart as would be the case in the two-and-a-half mile race for boys under fifteen, described by Dr. Whittingdale. Their senior steeplechase was only half-a-mile. He agreed with Dr. Whittingdale that it was better to cut down the long races than to restrict the small boys from athletics. Boys of all ages should be encouraged to engage in all forms of athletics under carefully considered regulations, and to keep themselves at all times in a state of good physical training.

Dr. J. F. L. **Whittingdale** (Sherborne) replying, said that with regard to the definition of a long distance race, he would say a mile or something over. Of course it was in the longest race, the steeplechase, that he met with these cases. On two different occasions, they were both very athletic boys and very keen on athletics. It was a great trouble to one of them to be cut off from his football for some time afterwards. He was one of the most promising young athletes in the school. Of course, as regards training, they might say a boy was nearly always in training, except the loafers; always running about from morning till night, regular hours, regular meals, regular sleep, were, he supposed, the best training. In rowing a long hard race a man was bound to do his best, but there were many cases of exhaustion which led, he believed, to subsequent heart strain. He suffered from it himself at one time. As regards compulsory races, he was familiar with one, a point to point race. In this race the house which gained the greatest number of points won the cup; therefore every boy who ran felt obliged to do his best, or else he heard about it afterwards. However, he had not met with cases of strain after this particular race.

A **Speaker**: Several miles?

Dr. **Whittingdale**: Yes, about three miles, and the house which obtained the largest number of points won. In a steeplechase, the boy who was first, obtained the prize, but it was different in the point to point races. He should only put a limit of age in long races. His experience was that there was no strain in short races. One could not tell from examination beforehand whether a boy was going to break down or not. He thought Dr. Childs idea of a half-mile steeplechase would amount to practically a hurdle race. Dr. Childs called it a steeplechase?

Dr. A. **Lockhart Gillespie** (Edinburgh) referred to a case where football was compulsory upon all boys day after day, and in which those who had no real liking for the game, or any ability in it, found that it did them little service physically and much harm mentally.

ortance of examining the Eyes of School Children as a ure of Preventive Medicine," by WILLIAM BUTLER, ., D.P.H.

(MEMBER).

ABSTRACT.

ho has had actual knowledge of the evils arising from
errors can fail to have been struck by the immense
f suffering and incapacitating illness for which they
nsible.

rect results: defective vision, asthenopia, squint, con-
is, etc., are themselves a sufficient reason for taking
preventive measures if it be possible, but when to these
he long list of nervous disorders which they aggravate,
ich they give rise, the case for timely interference is
strengthened. Headaches are minor illnesses which
thought too insignificant to merit any serious attempt
art of a health authority to mitigate by public measures.
ve consider the vast number of people who suffer from
es, and the utter misery and mental incapacity which
ny them, we shall find that the loss to the community
ced neglect of work is considerable, while the actual
g totals a mass which, if appreciated, would be profound.
that a large proportion of headaches are preventable,
ey arise from refractive errors which can be corrected,
ch, from ignorance, are permitted to go unrelieved. But
portant than this is the influence which errors of refrac-
ercise upon the development of nervous disorders of a
nal type. It is to the prevention of these that the future
of medicine will have increasingly to be directed. We
t regulate the pace of life, nor restore the phlegmatic
y of our ancestors, but the jar and glare and noise can
lued, structural defects made good and their accompany-
in relieved. Whatever reduces nervous strain in these
f over-pressure and nervous breakdown demands the
on of the medical officer of health. And eye-strain is
s the most universal of all the tensions which the 19th
y has imposed. Even normal eyes are not exempt, and
lies of structure mean almost certainly the development
roses of exhaustion which have their *origo mali* in ocular
s left uncorrected.

re is reason to believe that refractive-errors are increasing,
it be so it is an additional reason for exercising medical

supervision over the eyes of school children. Myopia is never found among savages. It is essentially a disease of civilization, and it has been stated that in Germany, if short sight continue to increase in the same ratio as it has during the past half-century, it is only a matter of a few generations before the whole population will have become myopic.

If it be conceded that the eyesight of every child attending school should be examined—and the importance of this has long been recognised—it follows that some one should be made responsible for the work.

The lines on which it appears to me this work could best be carried out as a part of general sanitation are simple.

School hygiene implies the co-operation of the teachers, and they, under the supervision of the medical officer of health, might, in the first instance, be left to ascertain the visual acuteness of each scholar. All cases of sub-normal vision should then be examined personally by the medical officer of health, and, where refractive errors were found to be the cause of the defective sight, the parents should be notified of the fact, and of the necessity there was for having the error corrected by means of proper glasses. Such a simple procedure, although it would not accomplish all that is implied in an examination of the eyes of school children, would go far, I am convinced, not only to relieve a vast deal of present suffering, but to remove conditions which are among the most potent causes of the exhaustive neuroses of later life. The points to which it has been my purpose to direct attention in this paper may be summarised as follows:—

I. That refractive errors are extremely common among school children, being present in over 50 per cent. of the scholars attending town schools.

II. That these errors are of great importance on account of the immediate symptoms and disabilities which follow their neglect.

III. That they are important factors in the production of many painful and disabling affections, common enough in childhood, but still more so in adult life.

IV. That this early correction is thus demanded, not merely as a means of therapeutics, but as an important measure of preventive medicine.

CONGRESS AT SOUTHAMPTON.

(Continued).

CONFERENCE OF
INEERS AND SURVEYORS TO COUNTY
D OTHER SANITARY AUTHORITIES.

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roceedings of the Conference commenced with an address
y the President, E. PURNELL HOOLEY, Assoc.M.Inst.
.E., which was published in the Journal, Part III.,
ol. XX.

New Sewerage and Sewage Disposal Works of the Borough
Southampton," by W. B. G. BENNETT, Assoc.M.Inst.C.E.,
rough Engineer and Surveyor.

(MEMBER.)

town of Southampton and parts of the rural districts
d it were constituted a county at a very remote period,
s boundaries fixed as early at least as the reign of King
who confirmed its first Charter, which was given by
y II.

e old borough of Southampton, before its boundaries were
ded in November, 1895, formed an irregular triangle, one
f which, the eastern, is bounded by the River Itchen, and
uthern by the Southampton Water and the River Test,
estern by the district of Shirley and Freemantle, now
led in the borough, the northern boundary or base of the
gle by a county road, known as Burgess Street, and a
stream, formerly named the River Anton. The area of
ld borough was 2,004 acres, and it was increased at the
of the extension of the borough to 4,417 acres, exclusive
d lands.

regards the population, one may look back into ancient
ry for the sake of comparison with the present time:—
ng the year 1600 we find the population probably did not
d 3,000; in the year 1821 the population was 13,353, with

2,249 houses; in the year 1831 the population was 19,324, with 3,562 houses; at the present time it exceeds 100,000 population, with 22,000 houses. Buildings are progressing at the rate of 800 houses per annum; and since the annexation over 10 miles of new roads, with their contingent soil sewers and stormwater drains, have been laid out by private enterprise, quite independent of public works.

As no doubt members of the Conference will hear much about the ancient history and statistics of the town in other places during this Congress, the author will not occupy further time on this subject, except to draw attention to an enlargement of a map representing the town about the year 1600, made for the purpose of comparison with the map of the town at the present time, both of which are exhibited on the wall. Taking this comparison into consideration with the brief historical statistics before given, it will not be difficult to conclude that Southampton has undergone considerable modification from time to time; and particularly does this modification relate to its sewerage system, which had become intricate and complicated, many sections of sewers being very ancient, too large in capacity, low lying, with flat gradients, and outfalls much below high-water level, rendering continuous discharge difficult, often causing impounding of the sewage, and subjecting districts to flooding at times of high water when accompanied by heavy rainfall; especially in conjunction with the fact that the sewers discharge from several outfalls on to the foreshores.

To remedy these matters, and completely prevent the overflow of sewage into the tidal way on either side of the town, the Corporation have thoroughly undertaken the reconstruction of the sewerage system, including the laying down of new soil sewers, storm-water drainage, and sewage disposal works, together with the abolition of the several existing outfalls mentioned, and in lieu thereof the collection and concentration of the sewerage of the borough at one outfall on the eastern side of the town nearer the mouth of the River Itchen, where an unobstructed discharge seaward is always obtainable.

The new main sewerage and sewage disposal works have been designed by the author, and adopted by the corporation, and commenced with the full sanction of the Local Government Board, they are now rapidly approaching completion, and are partially in operation.

To facilitate the description of the new works a map is given facing page 104, which is a reprint from Colonel Moore's *Sanitary Engineering.*

The combined area of the town over which these new works extend is 2,807 acres, divided into districts as follows:—

	Acres.	Population.
rn district	541½	45,000
ral or platform district... ...	303	15,000
ern districts, which includes the of Shirley and Freemantle and Millbrook added to the borough	1963	25,000

Northern District, including Portswood and Bevois
s not included in this scheme for sewerage purposes, but
ments have lately been effected at the Sewage Farm,
vill be referred to hereafter.

ations were first commenced in the Eastern District, that
ld part of the borough, by the construction of Sewage
l Works at the Corporation Wharf at Chapel; the
tion stone of which was laid by the then Mayor, Mr.
ıan Emanuel, in April, 1896, and operations have con-
since.

works here comprise Precipitating Tanks, divided into
mpartments durably constructed of brickwork in cement,
lly faced with Staffordshire blue bricks upon solid con-
oundations, supplemented in places by groups of beech
lriven where the land had been reclaimed from the River

compartments are completed, their dimensions are 60 ft.
ft. each, with a depth for sewage of 6 ft. 6 in. Three
rtments, each 76 ft. by 46 ft., at the same depth are in
of construction; the total capacity of the tanks is
000 gallons. They have been placed at a level to permit
fluent to discharge on the ebb tide after chemical pre-
tion; the compartments are interchangeable to facilitate
ng, each is provided with an 18-in. outlet, floating arm,
and scum boards.

e effluent before discharging passes through an open
ction chamber, faced with white glazed bricks and pro-
with a flight of stone steps to enable examinations of the
to be made at all times.

e tanks are sufficiently uncovered to permit of the chemical
tion being carefully watched.

ıe sludge is drawn from the bottom of the compartments
gh independent valves connected to a cast-iron sealed
, which leads direct to two of Shone's ejectors, installed in
amber below the floor of the tanks, these ejectors raise
discharge the sludge into a chamber in the press-house,
re it is thoroughly screened and treated with milk of lime

before passing to reservoirs in which it is allowed to precipitate, and the top water is drawn off by floating arms, after which it is discharged into two ejectors working automatically, and continually forcing it into three sewage sludge presses, under a pressure of 60 lbs. to the square inch, which is found sufficient to produce a good cake satisfactory to agriculturists, who purchase it at 2s. per cart load. The water drawn off the sludge falls back into the sewer, and is remitted to the tanks, the clarification of the sewage is found to be enhanced when this operation is in progress.

The sealed sludge main and valves previously referred to are placed in a sub-way between the tanks, an arrangement which affords ready access to them at all times without delaying the process: above the sub-way the sewage inlet channel is constructed, from which over-weirs controlled by penstocks the sewage falls into the tank compartments. In the division walls overflows are arranged at levels which permit of the sewage being treated either by the continuous or absolute rest system. The inlet channel is decked over, forming a walking way, and upon either side of this are placed the hand wheels of the penstocks and valves, thus giving the tank attendants command over the whole series of compartments.

The next portions of the scheme taken in hand at these Disposal Works were as follows:—main engine house and pump wells; penstock, screen chambers, mixing culvert and stores; installation of engines and machinery; air compressing engine house and sludge press house.

The author proposes to continue the description of the work in the order enumerated, but as members of the Conference had an opportunity of inspecting the works after the reading of the paper, it will not be necessary to enter into matters of minor detail.

The engine house has been solidly constructed in red brickwork, with stone and blue brick dressings, upon concrete foundations, taken to a great depth on account of the faulty ground; the south corner of the building is carrried upon screw piles and steel girders. The engine house is finished internally with glazed brick dado, wood block flooring, and diagonally boarded open roofing upon iron principals, and provided with lantern ventilation. The building is adequately lighted with side windows and circular lights.

The pump wells and screen chambers, which are in duplicate, have been carried down to a depth of 27 feet below the floor of the engine house, in Staffordshire blue brick in cement, backed with Portland cement concrete. This work required careful ng during construction, as the footings had to be taken eet below the foundation of the destructor shaft, which twenty-five yards away. No settlement or injury has ed to the shaft.

foundations for the engines and pumps were put down in te and brickwork, with masonry beds, constructed indentl of the walls of the main building, leaving a space, l as a subway, all round, and providing ready access to portions of the pumping plant below the floor. A ition was provided at the time for a future additional .

inlets to the wells and screen chambers are controlled by g-shaped penstocks with counter-balance weights.

screens are in duplicate, manufactured of steel to the ing dimensions—11 ft. by 7 ft., and 9 ft. by 7 ft., with by ⅜-in. vertical bars, ¾ in. apart. They are kept clean olving rakes, arranged at regulated distances on endless s working over sprocket-wheels, driven by a 3-horse steame. It is found in practice that a constant application of kes prevents accumulation of solid matter and sediment e wells, and greatly assists in the clarification of the e, and it is unnecessary for labourers to descend into the chambers or well for the purpose of cleaning them.

e wells are on the south-west side of the engine-house nally, from these wells the pumps lift the sewage, after ning, 20 ft., and deliver it into the mixing culvert on the -east side externally, where the chemicals are added.

e re-agent at present used is aluminoferric in block, but xact nature and quantity of chemicals to be used when the e volume of sewage of the borough is received at the s is under investigation and in the experimental stage by orough analyst, Mr. J. Brierley.

e mixing culvert has a double invert with sharp falls, the se ways and three steps; by this arrangement the sewage used to race and tumble before entering the conduit leading e precipitating tanks. Provision has been made for fixing is culvert two steam-driven rapid mixers, but up to the nt time the incorporation due to the racing and tumbling, lemented by the velocity of the discharge from the pumps the culvert, has been effectual.

stalled in the engine-house are three compound condensing thington sewage pumping engines, each with four steam nders, namely, two high and two low pressure, arranged by side; the valve gear is so adapted that in operation the on rod of one side moves the steam valves on the cylinder of the other side, the action is reciprocating, and the flow of the suction to, and the discharge from the pumps, is uniform and constant.

The pumps are of special construction for pumping sewage; their valves and general arrangement of pump work are such as is most suitable for that purpose. They are internal plunger pumps, double action of both suctions and delivery, and consist of two distinct plunger chambers arranged in one pump case, with the plungers coupled direct to prolongation of the piston rods.

A diagram of these engines and pumps was prepared for information of members and exhibited at the meeting. Each engine and pump is capable of emptying the wells at the rate of 2,200 gallons per minute; one is sufficient for the night work, two being required during the day, and the third to meet emergency, but owing to the fact that several old defective sewers yet remain to be dealt with and rendered watertight as recommended by the author, a large quantity of tidal water has to be lifted in addition to the sewage, necessitating at times the employment of the three engines.

This machinery was designed and manufactured by Messrs. J. Simpson & Co., of Grosvenor Road, London. From actual working they have been found economical in steam consumption, the pressure required is only 50 lbs. per square inch, and a controlling valve in the steam supply pipe prevents the pressure rising above this.

The maximum quantity of sewage lifted from the districts at present discharging into the wells has reached 2,781,000 gallons in twenty-four hours: a daily record of the duty performed by the whole of the machinery at these works is correctly kept by the Superintendent.

The air-compressing engine house, which is similar in design and construction to the engine house just described, contains a pair of horizontal condensing steam engine compressors, with air cylinders 20 inches in diameter by 24 inches stroke, arranged so to work either independently or coupled together, each of the compressors being capable of doing the whole work if necessary.

The air cylinders are fitted with Shone & Ault's patent low-lift annular valves, both for inlet and outlet air, which gives a large area for the passage of the air with a very small movement of the valves. The air cylinders are fixed on the same bed-plate as the steam cylinders, being placed behind them tandem fashion. The air is thoroughly cooled during compression by water jackets round the air cylinders; the steam

; are fitted with variable expansion valves, so that a ;ree of economy in steam consumption is obtained.

plant is used for operating at the present time nine ejectors, located in various districts of the town here-'erred to.

;reatest distance air is transmitted from the works is :wo and a-half miles. The maximum pressure these have been required to supply for the present works is o the square inch, and the steam pressure 40 lbs.

:he sludge pressing a pair of compressors have been l and installed in the same building, capable of sup-.ir at 90 lbs. per square inch. These are of the same the others, but with air cylinders 9 inches in diameter ches stroke, also arranged to work coupled together, but apable of doing the maximum work alone when necessary. :s. Hughes & Lancaster, of Victoria Street, West-, London, designed, manufactured, and erected the air ;sing machinery; they also supplied the whole of the , together with the air and sludge mains required under eme.

sludge press house, for convenience of working, has :cted in continuation of the air compressing house, and adjoining the precipitating tanks; in it have been placed uare framed filter presses, with space provided for future ı, each press containing 30 chambers, 38-inches square,)rrugations in the surface of the plates, which are :l with an outlet for the discharge of the filtered water ıe sludge. The presses are proportioned so as to be of working under a pressure from 90 to 100 lbs. per inch, the capacity being 1 ton 8 cwt. at each operation ss. The presses are provided with pneumatic cylinders, ton rods for opening and closing them.

ımway with trollies is laid to facilitate removal of the

record previously mentioned shows that the maximum of cake has reached 18·90 tons from 94·50 tons of wet per day.

sludge before pressing is dosed with milk of lime pre-.n two of Scott Bowers' lime mixers fixed in the press-and driven by a small steam engine; the lime is supplied :ler and fed into the mixers from an adjoining store in ed quantities by a small endless chain elevator. From xers the milk of lime flows into two hoppers connected ndently to the sludge inlet pipes of the ejectors before-ıned, the operation being that upon either ejector drawing

a charge of sludge from the reservoirs a dose of milk of li
administered at the same time, and the combination ej
into the presses; so soon as one press is fully charged
attendant diverts by a hand valve the flow into another.
ejectors being automatic in their action greatly facilitate
process.

The time occupied in charging, pressing, and removing
cake does not exceed 40 minutes, and the pneumatic cyli
for opening and closing the presses is found to work with
advantage. The quantity of lime used at each pressin
found to be 70 lbs.

In conjunction with these works new offices have been ere
for the superintendent and staff employed in connection
the sewage and house refuse disposal works, and 140 y
lineal of camp-sheeting driven for the protection of the
face of the wharf, the area of which was enlarged at the t

For nearly 15 years a Manlove, Alliott & Co.'s six-cell ho
refuse destructor, with a 30 horse-power multitubular
boiler, has been established on this wharf, working consta
and doing excellent service in providing steam power for
existing sewage work, but owing to the enlargement of
borough and the increase in the population it was found
sufficient for the requirement of the town. Under the pre
scheme this has been supplemented by the addition of four
by Goddard, Massey & Warner, and two 60 horse-power w
tube boilers, one being placed between each pair of cells.

An additional flue has been provided, so that the gases
be diverted from either destructor for the purpose of giv
access to the boilers and flues without impeding the burning
the refuse.

A Babcock & Wilcox 100-horse power water-tube boiler
also been inserted in the bye pass of the old destructor, wh
was reconstructed to receive the same.

The destructor shaft erected fifteen years ago was design
by the author of sufficient capacity to permit of additional c
being connected to it.

The high-level road has been extended on columns and st
girders all round the old and new destructors, giving the ca
an uninterrupted thoroughfare, and preventing delay in tippin

A weigh-bridge is provided at the entrance, over which
carts pass and record the weight of refuse brought in.

As regards the capability of these refuse destructors for supplying power for the machinery, the author finds, from his experience with them at these works extending over fifteen years
that a very great saving is effected financially. But unless goo

r is secured, it matters not, in the author's opinion, what-
pe of destructor is used, the work will be unsatisfactory
s regards the power obtained and the sanitary disposal of
fuse. This it must not be forgotten is before all things
inary function of a refuse destructor, and however well
ed a destructor may be there are times when other fuel
e used if the machinery is to be constantly going, as is
ary in sewage works.

author's calculations have received rude shocks from
, Bank Holidays, and wet seasons.

losing the description of the disposal works at the wharf,
thor would mention that it was originally intended to
nly so much of the sewage of the borough as discharged
the eastern district, but after the commencement of the
it was decided to bring the sewage of the whole borough,
the Portswood district, but including the added areas
west, to this site, and treat it in the manner described
discharging into the tide. The works had, therefore, in
t measure to be re-designed and enlarged accordingly.

New Sewers.

the diversions of the sewage to the new disposal works,
her purposes stated in the forepart of this paper, twenty-
iles of new sewers and storm-water drains have been
ucted of various descriptions and dimensions.

main intercepting sewers follow nearly the line of
r round the eastern, southern, and western fronts of the
a situation which renders certain the interception of all
s falling towards the water, and the disconnection and
onment of the old outfalls.

se intercepting sewers are delineated on the map, and
nced under the letters, BBBB, CCC, DDDDD.

the purpose of transmitting the sewage of the western
ts to the disposal works at Chapel, on the eastern side, it
essary to carry a sewer in tunnel under a higher part of
wn, and divert the sewage of the western districts received
e intercepting sewer, D D D D D.

e details of the construction of the egg-shaped sewers,
are of the new form, are as follows:—The invert blocks,
lly designed by the author, are made of blue Staffordshire
solid, and provided with rebated joints; the advantage of
ebate being that it enables a continuous invert to be ob-
d, and the block being solid is less liable to fracture from any

pressure to which it may be subjected; on a concrete foundation these invert blocks are laid, on which the invert is built of similar material. The remainder of the sewer is of purpose made red bricks laid in cement.

The main intercepting sewers, which traverse the Eastern District from North to South to the new Disposal Works, are of the following dimensions, starting from the Pump Wells:—436 yards of 4 ft. 6 in. by 3 ft. egg-shaped; 447 yards of 4 ft. by 2 ft. 8 in. egg-shaped; 426 yards of 3 ft. 6 in. by 2 ft. 4 in. egg-shaped; 130 yards of 30 in. Hassall's double-jointed pipes on concrete; 763 yards of 24 in. Hassall's double-jointed patent pipes on concrete; and, subsidiary to the before-mentioned, 1,300 yards of 18 in., 15 in., 12 in., and 9 in.

The sewers pass twice under the London and South Western Railway Company's line, where special works of construction were provided.

During the progress of the sewer work, a spring of fresh water was met with, which gave the contractors considerable trouble; this was ultimately conveyed by a sub-soil pipe to the disposal works, and is now utilized for condensing purposes. Self-cleansing gradients have been obtained for the whole of these sewers.

As a portion of this district, Northam, having an area of 78½ acres, being situated at a level too low to enable the sewage to gravitate to the wells, two of Shone's pneumatic ejectors of 500 gallons capacity each, "G" on map were put down in a brick chamber, in which provision is made for an additional ejector; these raise the sewage and discharge it into the head of the last mentioned egg shaped sewer.

The ejectors are operated by compressed air transmitted from the wharf.

At a further small district, Bevois Valley, of twenty-five acres, being also situated at a low level, but sewered prior to the commencement of this scheme, the sewage is lifted by gas engines, which have been retained and caused to discharge into the head of the new intercepting sewer.

In this district the old main sewers have been retained and utilized for rainfall drainage only, but in addition upwards of six miles of stoneware storm-water drains have been laid.

Formerly the whole of the sewage from this district discharged at a point over half a mile up the river beyond the new disposal works.

The central or platform district has not been re-sewered, as the sewers were found to be in good condition, but the sewage

cently discharged into covered tanks at the platform,
t was chemically treated, and the effluent discharged
tide. The sewage sludge was raised from the same by
hone's ejectors ("F" on map), and transmitted through
main to the wharf at Chapel, where it was mixed with
eepings, and the compost sold to agriculturists. The
working this ejector was transmitted from the wharf.
er obtained from the old refuse destructor was utilised
purpose of compressing the same. Under the new
the treatment of the sewage at this outfall has been
ed, and the sewage diverted through an 18-in. cast-iron
er, about 1,500 yds. in length, to the new pump wells
el. The old tanks are retained and utilised for the
of rainfall drainage during the time of high water;
assist in the discharge of such, a 750-gallon ejector,
used for the discharge of the effluent, has been
, together with the sludge ejector mentioned, the
sed air being supplied as formerly from the destructor
So far this completes the description of the works
ut under this scheme in the old borough.

eding now to describe that portion of the scheme car-
in the Western District, mention must first be made of
t that that portion of this district, Shirley and Free-
981 acres, had been previously sewered, and the sewage
ed into tanks on the western side of the town, situated
West End Railway Station (1 on map, p. 104). Here
age was chemically treated and the effluent discharged
oint, the sewer sludge being transmitted to the Chapel
by two of Shone's ejectors (1 on map), compressed air
tained in the same way as described for the platform.
ks and the two ejectors here have also been retained
purpose of dealing with the storm-water.

was decided under the new scheme to also abandon this
outfall and convey the sewage to the new place of dis-
amely, on the eastern side of the town, an intercept-
er is being laid from this outfall for the purpose, such
eing constructed as follows:—666 yards of 3 ft. 6 in. by
in. egg-shaped brick sewer, as before described; 540
f 30 in. cast iron pipe, and 820 yards of 27 in. cast iron
aid on a bed of concrete; 500 yards of the work is in
under a higher portion of the town, commencing from
stern shore, 100 yards south of the Public Baths, and
ling across in an easterly direction to the lower ground.

ortion of this district beyond Shirley and Freemantle,
res, was unprovided with means of sewerage or sewage

[illegible] annexation, but under the scheme this [illegible] sewered and storm-water drained. [illegible] stoneware and cast iron pipe sewers [illegible] in., [illegible] in., 12 in. and 9 in., [illegible] as before.

[illegible] will not permit the sewage to [illegible]. Two of Shone's ejectors of [illegible] put down in cast iron tubing [illegible] for additions: the sewage is [illegible] into the gravitating sewer. [illegible] the new sewer at the West End [illegible]

[illegible] district is compressed by a [illegible] being in duplicate, in [illegible]

[illegible] nearly eight miles of [illegible] discharging into [illegible] convenient places.

[illegible] a small three-cell refuse [illegible] working for nearly two [illegible] is connected to the [illegible] engine-room, and a 30 horse- [illegible] boiler inserted, which [illegible] the engines and [illegible] sewage, and also for com- [illegible] raising the sludge [illegible] on the land.

[illegible] per day, collected [illegible] to maintain the [illegible]

[illegible] chemical treatment supple- [illegible] beds specially designed [illegible] have been working with [illegible] results.

[illegible] in an economical manner. [illegible] whereas the materials [illegible] for the walls of the [illegible] filling them.

[illegible] wide, entirely [illegible] open oxidizing bed. [illegible] The sewage is [illegible] in a small detritus [illegible] through a stoneware pipe sewer [illegible] distributed in the chamber [illegible] V-shaped wooden shoots placed point upwards, and [illegible] are provided on either side of the shoots

ively, 2 ins. by 1 in., and 9 ins. apart, out of which the
flows and percolates through the beds. The shoots are
with 12 to 15 ins. of cinders : 3 in. agricultural drain
id at the bottom of the beds in rows 3 ft. apart collects
ent, which rises by gravity to a height above the surface
pen bed, thus saving loss of fall. Until recently the
tion had been by means of open half-round channel
is distribution has not proved satisfactory, and various
ents are being made to improve it; an automatic
g sprinkler is now installed, which gives a much better
ud evenly distributes the effluent from the first bed
e surface of the open oxydizing bed. The depth of
kers in the beds is 3 ft. 6 ins.

author has arrived at the conclusion from his actual
ents at these works that it is quite possible with refuse,
to provide sufficient power for driving the machinery
ection with the sewerage system of certain districts, but
effectually treat the sewage.

system is open to inspection by members visiting the
Farm, where the author will be glad to furnish any
tion that may be required.

JOHN PRICE (Birmingham) said there were one or two
s he would like to ask Mr. Bennett with regard to the
ion of lime used, but he thought he mentioned that the
treatment was in rather an uncertain stage. He also
d what the tank capacity was in proportion to the daily
discharge, and what the ordinary dry weather flow was,
factor bore upon the efficiency of the tank accommodation.

t.-Colonel **A. S. JONES**, V.C. (Finchhampstead), said he had
the works on the previous day, and was very pleased with
ellence of the arrangements generally. He found very little
e smell, and the works appeared to be admirably managed.
the present works were complete he hoped they would work
tisfactorily.

W. B. MORGAN (Weymouth) said he had a knowledge of
mpton extending over forty years, and was the predecessor
Bennett in the office of Assistant Borough Surveyor. He
bered the fearful trouble they were put to in Southampton by
le-locked sewers and the flooding of some of the districts of the
The whole of the sewers at that time were on the tide-locked
oir system, and owing to the peculiarity of the tides at
ampton which gave them four hours' high water during each
nd should rain occur at this period there was scarcely a small

shower but what some district was flooded. Mr. Lemon designed the platform tanks to relieve the sewers. In connection with those tanks a little story was told which proved the imaginativeness of some people when anything relating to drains was concerned. Some letters appeared in the papers complaining of the awful stinks from the platform tanks, whereas, as a matter of fact, not an ounce of sewage had been deposited in them, they being incomplete. It went to show that engineers and surveyors were often blamed unjustly. In coming to Southampton the other day, he reached Totton, when he had the pleasure of smelling his old friend—the western shore at Southampton. Like the backwater at Weymouth, the western shore at Southampton possessed a powerful odour, which was always more or less in evidence. The uninitiated attributed the smell to sewage, but that was not so. His experience was that the sewage had very little to do with the smells in question. The sewage might assist the growth of the seaweed. At Weymouth, although they had spent a large amount in taking the sewage out of the backwater and sending it to sea, they had the backwater still malodorous, although a very great improvement had been effected. Much has recently been said in Southampton about the deposit of sewage sludge on the western shore, causing a great stink. If that was really the cause of the stink, happy was Southampton, as the cause could easily be remedied, viz., by not depositing any more sludge on the shore. He was certain, however, that they would never thoroughly cure the smell arising from the River till they reclaimed the whole of the foreshore. The sewage should be treated, of course, but the smell arose from decomposition of vegetable and animal organic matter, principally of marine character, contained in the old slob, and during the hot weather at the end of August and the beginning of September the gases arise therefrom and cause the stench. But at Weymouth, it is satisfactory to state that the smell does not appear to be detrimental to the health of the district.

Mr. R. M. **Gloyne** (Eastbourne) said he should like to know the rise and fall of the tide, and the quantity of storm water for which provision had been made in the storm water sewers. He should also like to know the efficiency of the air compressing engines and the amount of leakage of compressed air at the end of the great distance, namely, 2½ miles, if there were any, and whether any coal was used in raising steam in the boilers at the Destructor Works, if so, the amount, and if not, what amount of steam was raised per cell from the destructors. Turning to the new sewers the question of concrete was one to which a great deal of attention should be paid, and he would like to know the proportions of the concrete. He also asked how the sewers were ventilated.

Baillie R. Anderson (Glasgow) said he was not a surveyor nor an engineer, but simply a Member of Council. He took a considerable interest in Glasgow sewage questions, and he had studied Mr. Bennett's paper with great interest, in view of the operations now ndertaken in Glasgow for the further disposal of the great of sewage they had to deal with. They had works at Dal- which were dealing with, at present, on an average of dry flow, from ten to twelve millions of gallons up to fourteen n millions of gallons per day, according to the rainfall, and estion he saw troubled Mr. Bennett at Southampton. The operations to be undertaken in Glasgow were for the comple- the works on the north side of the river, and they had let s for sewers to the amount of £200,000, and were anticipating works on the north side would cost about £700,000, while ere being prepared for the south side to cost over £400,000, nditure nearly 1¼ millions being contemplated to deal with ge question in Glasgow.

F. W. **Lacey** (Bournemouth) said he should like to know the two systems of treatment were entirely distinct or there was any chemical treatment before the sewage was in the works designed by Mr. Bennett. He was considerably ed in the bacteriological treatment of sewage because he had ete system of bacteriological treatment in tanks in operation at on the Dibden principle. He asked Mr. Bennett whether l give any analysis of results, and whether if after treatment ge is passed over land?

J. **Munce** (Belfast) said Mr. Morgan had referred to the of smell. When he arrived at Southampton on Friday gentleman who came from Plymouth remarked to him, a beastly stink! Oh those sewage works!" He gave the swer he could—viz., that he did not believe the sewage works ything to do with it. When he left Belfast on Thursday he passed on the railway four miles of shore which was in a es more filthy condition than the shore at Southampton, h there was no town there and no sewage to pollute it. He satisfied that the sewage works had anything to do with the of weed upon the shore, as he mentioned at the Birmingham s. He had a theory then, and it had been confirmed by ith old fishermen since, that it was owing to the change of g, from sailing vessels to steamers, during the past ten or years that that weed was deposited upon the shores of har- in greater quantities. Sailing ships only came up to the rs at high water, but steamers came up at all states of e, and the wash of the steamer and action of its propellor cut ed adrift at and near low water, and on the rising tide the lows it ashore. In a case he knew well if there was wind the night the shore, which on the evening before was clear of in the morning was covered thickly with it. If the sewage the weed the deposit on the beach would be continuous; instead t it only appeared when the wind blew from a certain direction, sappeared if the wind blew the other way before decomposition o far advanced. It might be the sewage tended to assist the growth of the weed, but it did not deposit it on the shore. He hoped that gentlemen who wrote for the Press would take note of the fact that engineers are anxious not to make stinks but to prevent them. It often happened that a person smelling something thrown by a careless person upon the shore got the impression that the whole foreshore was bad and everybody was being poisoned. He mentioned as a curious thing that the place he had spoken of where the foreshore was so bad was the healthiest in Ireland, in fact the doctor said it was "woefully" healthy.

THE PRESIDENT OF THE CONFERENCE (Mr. E. Purnell Hooley) said Southampton possessed opportunities for the disposal of the effluent from sewage treatment which they of the Midland Counties often envied. When a town had the sea where it might discharge the effluent, it was very lucky. Let them turn the effluent into a dry ditch and they would see the difference. Mr. Bennett had given the population and the sizes of the tanks. As far as he could make out that allowed for thirteen gallons of sewage per head of the population. How many times a day were the tanks emptied?

Mr. W. B. G. BENNETT (Southampton) in reply said that the tanks were emptied eight times in twenty-four hours, and in regard to the capacity of the tanks, these tanks had been kept up to a level that enables them to discharge at all times of the tide; they discharged eight times during the 24 hours. He was obliged to the gentlemen who had spoken for their kind remarks which were calculated to be of assistance in a time of trouble and difficulty with regard to the nuisance on the shores of the Borough. He quite agreed with Mr. Morgan who remembered the smells of forty years ago, before the new works were thought of, so that the nuisance could not be attributed to the new works. The rise and fall of the tide at the Disposal Works was about 14 ft. or 15 ft. Very little leakage of air had been discovered in the air mains. The concrete was gauged 8 to 1. As regards the question of ventilation, the sewers were constructed with self-cleansing gradients, and being new sewers there was very little gas produced; the Corporation had the subject of ventilation under consideration, all they had done up to the present was to erect upcast ventilating shafts. Another question was asked in regard to whether any additional fuel was used at the Destructor. It was necessary at times to use other fuel for instance in wet or hot seasons, or in the event of a combination of workmen or a strike, and holidays. In regard to the filter beds the sewage was not treated before it entered the beds, and the results were very satisfactory The object they had in view was not so much to get a high class effluent, but to do away with the sludge. They had succeeded in their experiments in throwing the whole of the sludge into liquefaction. They had got rid of the sludge difficulty so far, for a portion of the drainage district.

Provision and laying out of Public Pleasure Grounds in ll Towns," *by* GILBERT J. HUNT, Borough Engineer d Surveyor, Dorchester.

(MEMBER.)

ABSTRACT.

are few towns of any size or pretension in this country lo not possess public parks or pleasure grounds, but so an hardly be said of the smaller towns with populations ; below 25,000. In these smaller towns, however, it is sual to find a considerable proportion of the inhabitants l together in hovels which are dignified by the name ling houses, but lack every comfort and convenience, en will not permit the ordinary decencies of civilized he sanitary condition of these areas is very little better he slums" in the larger towns.

being so, the lack of comfort and pleasurable surround- der which so considerable a proportion of the population of our smaller towns exist, is surely a sufficient reason local authority should exercise the powers so freely ed upon them, and provide public pleasure grounds for abitants, whose well being it is their duty to procure.

Public Health Act, 1875, Sec. 164, confers exceptional s on local authorities to obtain land for the purpose of leasure grounds, or to contribute towards their support, ded by any other person. And this power is consider- xtended by Section 45 of the Public Health Acts ment Act, 1890, which enables an urban authority to te towards the cost of the purchase, laying out, g, or improvement of any lands provided by any person have been permanently set apart as public pleasure s, even outside the limits of their district, provided that e so situated as to be conveniently used by the inhabit- their district.

fact that such exceptional facilities have been given, es better than any other argument, that the provision of pleasure grounds must be regarded as distinctly bene- o the health and interests of the public at large, and Authorities should not hesitate to consider it in this nd act accordingly.

h regard to the situation no hard and fast rule can be wn, except that it should be easily accessible for the for which it is intended, or, as it is very aptly described in the words of the Act above quoted, "so situated as to be conveniently used." It is preferable to have more than one such resort, even though the area of each be curtailed, rather than that any considerable section of the inhabitants should be out of reach of the attractions and benefits which are thus afforded. There can be no question that surrounding residential property is materially enhanced in value by its proximity to well-conducted and well-kept pleasure grounds, and it is a strange fact that this is not more generally recognised by property owners in the development of their estates, and that they do not in their own interest set apart land for this purpose.

The method of laying out and planting will to a large extent be governed by the situation, contour, and natural features of the site; it is, however, in the judicious and careful selection and arrangement of the planting that the success or failure of the design will mainly depend, and as nothing but practical experience can enable one to form a correct or reliable judgment on this important aspect of the case, it is better to be guided by the opinion of an expert before finally deciding on any proposal.

The roads or paths should be so arranged that the public may with the greatest ease and facility perambulate the grounds and obtain the most diversified and pleasing impressions. A better effect is generally produced by laying out the roads in bold graceful curves than in straight lines, and entrances should be provided to give ready access on all sides. The flower-beds should be massed or grouped together in preference to being scattered about here and there.

In carrying out works of this kind it is preferable that the preparation of the ground should not be made subservient to a contract price, the results will be far more satisfactory if carried out under the supervision of a competent foreman gardener, and the trees and plants should be selected at the nursery. The whole of the areas to be planted should be trenched to a depth of 2 feet 6 inches, and suitable soil should be provided. The lawns should be carefully levelled and covered with a layer of good loam, and if intended for tennis should be laid with good clean, "down" turf. All the verges and borders round flower-beds and shrubberies should also be laid with turf, which will ensure a clearly-defined line being maintained.

The selection and varieties of trees and shrubs suitable for planting are dealt with at length in the paper, as well as the formation and maintenance of roads and paths, the provision of water for watering purposes, the fencing and entrance gates, ornamental structures, band stand and shelters, seats, conveniences; also bye-laws and regulations.

onclusion, particulars are given of the public gardens t by the author at Dorchester. The land, 5¼ acres in as purchased by the Town Council at a public auction 400, the land being offered as a building estate, and it was from designs prepared by Mr. Wm. Goldring, an eminent pe gardener of Kew. The area of the garden has since tended by the purchase of adjoining nursery premises, ing a roomy dwelling-house and glass-houses, covering of about half-an-acre. The bulk of the glass has been d, sufficient only being retained for rearing all the plants required, the dwelling-house being utilised as idence of the head gardener, with dressing-rooms and es reserved for the use of tennis players.

following figures give the details of the cost:—

	£	s.	d.	£	s.	d.
se of land and legal ges	3,504	3	10			
se of house and premises ning	1,878	15	0			
				5,382	18	10
ht iron fencing	254	5	2			
e gates and stone piers (2)	60	9	6			
wire fence	13	14	8			
g fence	36	9	1			
				364	18	5
nd shrubs	204	2	11			
for paths	174	4	3			
... ...	6	15	0			
... ...	25	0	0			
drains	41	12	10			
seats	42	6	0			
&c.	11	4	3			
ngery and tools... ...	20	4	9			
... ...	485	4	0			
				1,010	14	0
ions to premises, erecting c lavatories and boundary	255	14	8			
n of bandstand, with store rneath	297	5	0			
				552	19	8
Total capital outlay ...				£7,311	10	11

Mr. J. T. **Eayrs** (Birmingham) said the subject of pleasure gardens did not so frequently come in their way as engineers as many other matters they were more in the habit of discussing. Still it was a subject they ought to know a great deal more about, and the consideration of it was quite as necessary as affecting the public health even as the ever green sewage question. He thought they would all agree that the author of the paper had expended a great deal of time, labour, and trouble in preparing that most valuable contribution. One point he should like to draw particular attention to. The author of the paper appeared to insist upon the provision of "pleasure gardens" as gardens rather than "recreation grounds" or "parks" for the people. He took rather a different view. He considered public grounds should be for recreation, not for show purposes. Even if some parts of the grounds were laid out in an ornamental way where people might be warned to "keep off the grass," the major part ought to be devoted to purposes of recreation. Whenever public pleasure grounds and parks were laid out the value of the adjoining land was considerably enhanced, and that was to the profit of the adjoining landowner. Some landowners were "cute" enough and philanthropic enough to give pieces of land in the centre of their estates for the purpose of public pleasure grounds and parks, and the value of the gift was often returned to them ten-fold by the increased value of the surrounding land as a building estate. It was a question therefore whether local authorities ought not to have the power when purchasing land for public purposes, of buying a great deal more than was absolutely necessary for the immediate object in view, in order that they might lay out the surplus for building purposes, in such a manner, both as to the construction of roads, sewers and other matters, as would secure the best sanitary conditions, and set an example to the owners of land in laying out their estates, and at the same time secure for the ratepayers the profit on the enhanced value of the land by reason of the construction of the public works, which would in many cases reduce very considerably the charge on the rates. He mentioned that there is a good example of this principle in the case of the public park at Hanley. He noticed the charge upon the rates at Dorchester was £379 per annum, practically £1 a day. He should like to know the rateable value of Dorchester and what a penny in the pound produced, what the charge upon the rates was for maintenance, and also the interest upon the outlay.

Mr. G. J. **Hunt** (Dorchester) in reply said that he did not recommend pleasure gardens in opposition to recreation grounds, the two things were separate and distinct, served different purposes, and appealed to different sections of the community. By all means have recreation grounds, which, of the two, are probably the more essential, but he held that it was a mistake to attempt to combine the two in laying out small areas. If they wanted a garden, it must be laid out as a garden, and kept as a garden; if, on the other

a recreation ground was required, it was useless to attempt to
out as a garden, always bearing in mind that the planting of a
r of trees and shrubs and the laying out of paths do not
arily constitute a garden. The cost of maintenance of the
ester Borough Gardens for the past year represented a charge
in the £ out of a total rate levied for sanitary purposes of
. in the £.

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ome *Notes on Sanitation in Rural Districts*," *by* THOMAS
Y, Surveyor to the East Retford Rural District Council.

ABSTRACT.

Varying Conditions of Rural Districts.

L Districts, unlike Urban Districts, vary in many of
conditions. One district may be "rural" in name, but
an " in fact; another may be "partially urban," with bye-
n force in some parishes, but not in others; and another
lly rural," without bye-laws of any kind, except those
ng to common lodging-houses, and in the veriest non-
essive districts the latter bye-laws are considered necessary.

Public Health Acts.

ne sections of the Public Health Acts are not of simple
ruction. Numerous legal decisions have invested many
ns with an indefiniteness that is at once alluring and at
fatal to Local Authorities and their officials. For in-
e: When is a drain not a drain?
ction 23, relating to "a *house* without a sufficient drain,
should be amended to include stables, cowsheds, and pig-

ction 36, with reference to the provision of a sufficient
, &c., has been somewhat simplified by the case of Wood
idnes Corporation, and notices under this section should be
ed in accordance with the judgment in the case.
ere is much necessity for the consolidation and simplifica-
f the Public Health Acts, and the aid of practical men,
rienced in the working of these Acts, should be enlisted in
r to achieve a successful result.

Sanitation v. *Fresh Air.*

he importance of sanitation is apt to be overlooked in rural
icts, owing to the mistaken notion that a bounteous supply

of fresh air is ample compensation. Fresh air does not always balance insanitation, *vide* Dr. Handford's Report (June, 1899) to the Nottinghamshire County Council. The death rate alone is usually adopted as the basis for estimating the sanitary condition of a district, no account being taken of illness arising from preventable diseases, and the consequent expenses caused too often by insanitation and unwholesome water. The total cost of dealing with infectious illness in rural England and Wales would probably be sufficient to provide wholesome water and effective sewerage where required, and these undoubtedly minimise the risk of such diseases.

Water and Sewerage.

The objection, in wholly rural districts, to the provision of public water supplies and effective sewerage systems, is too often one of £. s. d. Every parish would welcome these benefits, if the district in general would bear the cost, but since the outlay has to be borne by the parish affected, such works are invariably postponed. There might be less objection if the Local Government Board would extend the periods for the repayment of loans for these works considerably beyond the customary limits.

Sanitary Improvements to Private Property.

Generally the cottages have been most neglected, and it is upon this class of property that the majority of sanitary defects are found, especially in the matter of drains, closet accommodation, and water supply.

Disinclination of Occupier to complain.

There is a general disinclination upon the part of the occupiers of houses belonging to other people to complain of insanitary conditions, owing to the fear of receiving notice to quit, or to suffer increased rent, one or other of these disagreeable alternatives invariably resulting from expenditure caused by the sanitary officer's visits, whether the occupier has complained or not, by way of discouraging the others.

Scarcity of Good Cottages in Rural Districts.

Suitable dwellings of the cottage class, and those of the next grade, are extremely limited in number in wholly rural districts. Owners of land assert that it does not pay to build new cottages, they consequently seldom do so. Land suitable for building purposes is often difficult to obtain, but even if it were not, and other persons built this class of property, the invest-vould doubtless be unremunerative in agricultural dis- This deficiency of suitable house accommodation not rally explains the reticence of occupiers to complain of ıry conditions; yet, with all this, one is amazed that beings could endure uncomplainingly the insanitary ıdings that at times come under the notice of sanitary The fact cannot be overlooked that some occupiers t themselves the most desirable persons for whom to improved sanitary conditions. There is with many a ıg regard for the old-fashioned privy midden, yet its ın and the substitution of a pail closet is fraught with onsequences, unless the scavenging be carried out by the Authority.

Domestic Sanitation.

primary features of domestic sanitation comprise the dis- tion of sink discharge pipes, the provision of an efficient operly ventilated drain with trapped gulley, and suitable ınd ashpit accommodation. When these are accomplished oper manner they form object lessons, but unfortunately rage country workman is not usually up-to-date in sani- nd especially drainage work, sanitary officers therefore ıtly teach them how it should be done. So little is good y drainage understood or appreciated, that men engaged ning agricultural land are frequently employed in the on of sanitary work, and the individuals themselves are ed as experts by some people.

By-Laws.

il the adoption of by-laws, especially in relation to new ıgs and nuisances, becomes compulsory, there must always rge amount of go-as-you-please work.

h by-laws in force for new buildings, those about to find that as one small, but by no means unimportant, f their duties, they must consider and describe their pro- water supply. Without by-laws this is generally left he last, with troublesome consequences.

vould entail too long a paper for this Conference to deal r with the many difficulties that are daily met with in ecution of one's duties, which even Acts of Parliament y-laws leave alone, and which, while public life is carried its present form, must exist.

Mr. R. F. Vallance (Mansfield) said the difficulties of an official in a rural district were very great. When it came to a question of the rates being raised from 2s. to 3s. in rural districts for those privileges the farmers and others, comprising the rural councils, hesitated before undertaking the expenditure. He agreed that the old wet middens should be abolished at once, they constituted a fearful abomination in some districts.

Mr. A. Smith (Nutford) said that unless they had a good system of sewerage and water supply they could not have the visitors. That point was being pressed in many east-coast villages to the consequent improvement of the local sanitation. One of the difficulties in connection with privy middens was that some of the large borough towns having these privy middens were bringing the refuse into the rural district.

CONGRESS AT SOUTHAMPTON

(Continued).

CONFERENCE OF VETERINARY INSPECTORS.

ceedings of the Conference commenced with an address he President, W. HUNTING, F.R.C.V.S., which was lished in the Journal, Part III., Vol. XX.

ties of dealing with Tuberculosis in Cattle," by T. B. GOODALL, F.R.C.V.S.

ABSTRACT.

ntion of the paper is not to throw discredit on what done with regard to tuberculosis, but rather to point fficulties of carrying into effect the methods suggested ng with the question.

the Government are prepared to take the matter in position of the Veterinary Surgeon is not an enviable may detect the disease and offer suggestions, but he eans of knowing whether they are complied with.

ng from the tenour of a speech reported to have been by Sir G. Brown to the students at Cirencester lately, we can scarcely expect the Government to deal question.

ake it for granted now that tuberculosis is very t amongst cattle, and that there is a certain amount r to man by his ingesting the uncooked milk from mals.

e application of the tuberculin test, we can almost detect affected animals.

is the veterinary surgeon to advise the owners of cows dairy-farms to deal with re-acting animals? those e no *clinical* evidence of being affected?

must be either isolated, removed from the premises, or or the butcher.

r of these methods may be carried into effect by people nce, who merely carry on their dairies for a hobby, but with the dairy-farmer, whose whole capital is invested stock, and has now but a narrow margin for profit—e say that he must be compelled to slaughter, or get rid of, or isolate some thirty per cent. of his dairy stock, it would mean ruin to him.

With the general accommodation of an ordinary dairy farm genuine isolation is impracticable ; there is but bare byre-space on the premises for the cows ; there is no spare place for re-acting ones, so that, unless they are kept in the same house as the healthy stock (which is mere quibbling with the question if the disease is so contagious as experts say), special isolation sheds must be erected on all farms.

And again, to give real effect to the many suggestions made, quarantine sheds must also be built for the housing of newly-bought cows before they are tested and allowed to mingle with the herd.

Unless the veterinary surgeon has the power to mark or brand re-acting animals, he has no means of distinguishing them ; but the owner naturally objects to this because it would lessen the value of his cows.

There are other difficulties connected with the isolation of re-acting cows.

If a farmer elects to sell his re-acting cows, he may send them to market where they may be purchased by another farmer, and the first farmer may buy in cows that have re-acted because none of them are marked or branded, and they cannot be identified.

If they are slaughtered they must be sold at a great loss to a second- or third-rate butcher.

Recognising these difficulties I have refused to test the cows of dairy-farmers, for I knew that they could not comply with the instructions and regulations that should follow.

To sum up, if the matter is taken seriously in hand, it seems to be necessary :—

(*a*) That dairy-farms must have isolation and quarantine sheds.
(*b*) That the Veterinary Surgeon must have power to mark or brand ;
(*c*) Needs to exercise caution in certifying animals as free from disease ;
(*d*) Should have power to control the movement of re-acting animals.
(*e*) Unless the tuberculin test is made general and compulsory it is worse than useless.

In the meantime it should be a punishable offence for anyone to keep an animal in milk, with tuberculous disease of the udder, on any premises from which milk is sold to the public.

an **Cain** (Bootle) wanted to know if the author would em, in the event of what he recommended so strongly—that should be fed up for the butcher, what was to become of er. He was not aware that the animal had reacted, and :tor might come round and seize the carcase. Now, that unfair, and he (Alderman Cain) thought they should have ;estion as to how the butcher should be protected.

dney Villar (Harrow) said that if they, as veterinary carried out their duties as to testing properly and gave ificates, there was an end of it as far as they were con- r the sale of animals suffering from tuberculosis was not l by law. Mr. Goodall spoke of isolation in connection question of what to do with infected animals, but at the pointed out the difficulty of isolating them. He suggested sheds, which would have to be built at great expense to the ner, but he (Mr. Villar) did not think Mr. Goodall said about the isolation of affected animals in fields. He took it nimal could find no better place picked out than in the open nder such circumstances he was certain that a large number y infected animals would recover. A question not to be lost was the remarkably quick way in which tuberculosis may nong the herd, and he could quote a case where seven out of eleven in one shed became infected in the course months. As to length of time after being tested an infected cease to react, he could say that within his knowledge some n tested twice within a week and reacted on both occasions. l to him that the reaction was not quite so marked after the noculation, but it was clear that infected cows did react a me in some instances.

. B. **Pease Ford** (Bentham) said from Mr. Goodall's ns he had gathered that all dairy farms ought to have ly arranged cowshed for the purpose of isolating cattle ad reacted, and were infected with the disease. Were farmers to be compelled to have these isolation sheds on ms? Farms varied from ten to some hundreds of acres in nd it would be clearly impossible to provide a proper hospital farm. He would like to know how it was to be carried out, ld suggest whether anything could be done towards the ment of cattle hospitals, to which cattle could be drafted off ed and so relieve the poorer farmer of their infected cattle, prevent the infection of others.

. H. **Slocock** (Hounslow) said he had found that in cows, cted with tuberculosis, but which had received slight injury the time of injection, the temperature rose to a great extent. it were true that 30 per cent. of cattle were certified as with tuberculosis, that showed what a vast thing they had in they refused to accept the milk of these cows. We took it from experiments that the milk of those cows, although they were affected with tuberculosis, was not injurious to health, and he believed that unless they had tuberculosis of the udder or tuberculosis to any great extent, the milk of the cows was good. He believed with regard to the majority of these cows that the milk of the cows slightly affected with tuberculosis would have to be accepted for some time to come. Of course the cow would have to be isolated, for if it were allowed to remain in a shed in which there was not a lot of head room it would transmit the disease to those near to it. As to branding, he quite agreed that it would be a good thing if every cow affected with tuberculosis were branded, and if allowed to remain in a dairy shed should be inspected periodically to make sure that the disease was not advancing to any great extent and was not affecting the udder.

Mr. A. L. **Butters** (Paddington) said a great deal had been said on the subject of bovine tuberculosis, and a number of difficulties in dealing with it had been pointed out. He thought these showed very clearly, if nothing else, the necessity of tuberculosis being scheduled among the Contagious Diseases of Animals Acts, while there had also been pointed out the necessity for uniformity of action in carrying out the measures which should be adopted for its suppression and disappearance. When they considered the milk supply of our large towns and how it was drawn from areas considerably beyond the powers of the local authority, sometimes sixty or seventy miles distant, though these authorities might strictly carry out the provisions of any act which might have been passed, yet the dangers from using milk from tuberculous cows would not be reduced by their action unless the measures were adopted uniformly all over the country.

Mr. J. T. **King** (Bournemouth) said with regard to the question as to how long cattle after testing should be again retested, he was of opinion it should not be done under a month. He had tested a great many cows lately, and he might mention that out of 90, 35 reacted. That only showed that these reactions should be tested again, and they were in about a month of the first test, when only 27 reacted, the others apparently having either been rendered immune, or received some careful treatment which rendered them unaffected. In one case, that of a bull, out of a large number of cattle which exhibited the most diagnostic reaction on the first testing (the temperature having risen so gradually), was again retested in a month to a day, when there was no reaction. He was greatly pleased with Mr. Goodall's paper for he had thrown out some useful hints, but the only way in which good would come was by making a strong representation that means should be universally employed for the prevention of the disease, by the application of the tuberculin test.

Councillor W. **Roberts** (Liverpool) said he was much obliged to Mr. Goodall for his excellent paper. Speaking of Liverpool, they

6,000 cows tied up there in cowsheds. They had a daily . a certain number of inspectors going round to the various and the owners of the cows were very anxious to have ed, and anxious, too, to weed out those which reacted. ises of cows suffering from tubercular disease, the inspectors ie owners to part with them, and the Corporation of made some little grant to the owners. They got rid of them, hem to the butcher. In one of the Lancashire asylums, ie (Mr. Roberts) was a member of the Visiting Committee, from 100 to 200 cows, and they had them all tested ly they were purchased. Those that reacted were separated. them tested again, sometimes a month afterwards, and they found that they did not react. He was sorry to say ontagion was spreading in that asylum very rapidly. They erinary officer in connection with that asylum who was a t man, and if he found an animal suffering to any great uld not certify it, while if it was entirely unfit to be used destroyed altogether.

WHITLEY BAKER (Wimborne) spoke of the importance of n the Government the necessity of adopting legislative and of requesting the Government to appoint as inspectors nspection of cattle and dairies and other premises only o were competent to undertake the inspection.

llor **SKELMERDINE** (Liverpool) said it had been the fashion to change hands without a veterinary certificate, but he did hy a veterinary certificate should not be required as much case of horses, indeed, he considered it more important, g used for food purposes: he thought that that might be out of the difficulty. His own idea was that all cows should ied twice a year, to find out if they were healthy or un-

'RESIDENT OF THE CONFERENCE (Mr. W. Hunting) said that dall told them at the close of his paper that unless the n test was made general, it was worse than useless, but he ident) was inclined to think that he had not covered the ound. At the present time they had what was called the r system in connection with the carrying out of these tuber-ts, which seemed to have satisfied some people. They had a d system of fraud, for it consisted of testing a man's stock ding the affected animals out at the expense of other people. atter of fact what had saved the British public, up to the time, from being largely affected by tuberculous milk was y one per cent of cows were affected in the udder. The is milk was so diluted by the milk of healthy cows that ho drank it escaped infection. If the voluntary tuberculin re thoroughly carried out there would be cows without any losis in some sheds, and cows—every one of which was affected with tuberculosis, in others. The result would be that the users of milk from the latter would be poisoned with certainty. There was no midway between this selfish, so called, voluntary method, and general and uniform legislative measures. The whole thing logically pointed to legislative action and a general attempt to suppress the disease. They were told that if there were danger in meat and danger in milk very few suffered from it, but it did not matter what the exact number of deaths were. If but one in a million were killed on our railways it would be no consolation to meet with an accident which could have been prevented. If they had to deal with a preventable danger let them prevent it. The voluntary test clearly would not do so, and the only other thing was to try legal control. They were told that tuberculosis was not the same as other contagious diseases, and that it was extremely difficult to deal with. One of the difficulties of tuberculosis was that it had been allowed to go on so long that it had spread to cattle all over the country. Having so thoroughly spread it seemed strange that it should be allowed to continue unchecked; they must do something to meet it, or it would assume even yet larger proportions. It seemed to him that not to move in this matter was like a farmer allowing one of his fields to get full of thistles before he attempted to get rid of them. The difficulties in the way were matters of self-interest more than anything else, but he did not think that that was an impossible one to overcome. The people who cultivated and spread tuberculosis were the farmers and breeders of cattle, but the people who suffered the chief loss were the butchers and cow keepers. The farmer, who was absolutely able to test any of his cattle, could go on breeding tuberculosis as long as he liked, and none could interfere with him because the Board of Agriculture did not use the powers it possessed, and would not, until obliged to do so by the voice of public opinion.

Mr. T. B. Goodall (Christchurch) said that it had been stated that he first recommended that the animal should be sent to the butchers, whereas he only said that in the voluntary system for stamping out tuberculosis one of three things must be done, the cattle must either be isolated, removed from the premises, or fatted for the butcher. He said that it was a difficult thing to deal with because no one but a second or third rate butcher would buy the carcase. He did not recommend it, but it was one of the three alternatives left them. Mr. Ford asked about the practicability of building isolation sheds on farms. He (Mr. Goodall) said it was impracticable, or almost impracticable to build hospitals for cows. But reacting cows were to be isolated, and for the matter to be taken up in the thorough way that people suggested, there was only one way of following the suggestion, and that was building isolation sheds, and thus keeping the animals in quarantine. Respecting the question of more facilities for the framing of by-laws, it was said that reacting cows should not be sold to the public, but we had no means of preventing this. And if the carcases of these animals were

sale as food it seemed to point to the necessity of having
inspected by men who knew thoroughly what they were
l were really capable of deciding whether it was really
l or not. Then there came the question of compensation,
ardine suggested that the cows should be tested twice a
was quite right, but what was the use of that unless they
wer to mark and so to know the cows which reacted, Mr.
aid that practice was worse than useless.

l *Inspection*," *by* SIDNEY VILLAR, F.R.C.V.S., County Veterinary Inspector, Middlesex.

inspection as it at present obtains in this country is
unsatisfactory footing.
nditions under which milking cows may be kept is in
s of Local Authorities, who may make their own
ıs as to sanitary arrangements of cowsheds in the
n of persons following the trades of cow-keeping and
and for the inspection of their milking cows.
made such regulations, the Local Authority may
hem or permit them to be absolutely ignored. In
ıce, cow-keepers in some districts, more especially in
as, are placed under rigid sanitary supervision, whereas
districts milk is allowed to be produced under condi-
surroundings which may rightly be described as filthy
treme.
o produced without sanitary restrictions at out-of-the-
ıs in country districts is, in these days of quick railway
ent to our populous centres.
ractice is detrimental to the public health, and unfair
pervised cow-keeper.
im of official cowshed inspection is the production of
k—to this end proper provision for the health of the
e cleanliness of the animals and their surroundings,
r supervision by competent officials should everywhere
compulsory.
ugh in rural districts, where cows are housed for only
eeks in mid-winter, or are kept continuously in the
me laxity in the construction of cowsheds may be
to prevail; it is in exactly such places as these that

the surroundings of the cows—more especially as to the water supply both for their drinking and for the cleansing of milk vessels, together with the situation of the manure heaps and cess-pits—are found to be bad.

So many different views are held by dairy farmers as to the best design for cowsheds, and so many buildings not originally intended for occupation by dairy cattle are converted to that purpose that it is well for Inspectors to deal broadly with the question of design, and to approve of sheds provided certain fundamental details are complied with.

These essential details are such as provide for adequate ventilation and lighting, for an efficient water supply in or near sheds, and for floors and drainage so constructed as to render cleansing of the sheds effectual and easy.

Many opportunities have occurred to me of inspecting cowsheds in various parts of the country, and I am convinced that speaking generally, there is no better method of housing milking cows than that in vogue on the better class dairy farms in the suburbs of the metropolis.

On most of such farms it is customary to keep cows in their stalls for at least eight months in the year. Some form of official inspection has long existed in these districts, and for many years past it has been the custom of the trade to invite purchasers of their milk and the public generally to call and view the cattle and their surroundings. In attempting to secure the approval of such visitors practical knowledge of the most successful methods of housing cattle for the maintainance of their health and cleanliness has been accumulated by cowkeepers, and the form of shed now used is the result of actual practical experience of the requirements of cattle, combined with scientific details as to ventilation and drainage suggested or enforced by the officials of the Local Authority.

Undoubtedly, the most important factor in the sanitary arrangement of a cowshed is ventilation, and associated of course with ventilation is the question of air-space.

Provided effectual means for the frequent changing of the air within the building is secured, the cubic space allowed for each animal may be permitted to be considerably less without detriment to the health of the occupants than is by many supposed.

A shed in which fourteen Shorthorn cows have been continuously tied up during the winter for the past ten years allows only 470 cubic feet per animal, yet it is within my knowledge that the cows keep remarkably well.

I do not advocate so small a cubic space, but am of opinion that a moderate-sized well-ventilated building is preferable to hed containing few cows, where the means of ventila- blocked to keep the interior of the shed at a genial ure.

g in mind the important part the wind plays in n it will be recognised that the air of sheds in hilly unsurrounded by other buildings, is much more readily than the air of sheds in populous places, provided that fresh air and outlets for polluted air are permitted to

mount of air required by an animal at rest is propor- to its weight. Cows of different breeds differ sly in weight; and the same animal at seven years old lly weigh much more than at three years. It is there- ult to fix a mean aggregate area for inlet and outlet of

hn Speir, an authority on this point, says:—"With a eze moving at from two to four feet per second, a byre mply ventilated with an inlet of twenty-five to thirty- re inches per animal, . . . if the outlet area is at least this." Another authority insists on permanent open- h an area of fifty-four square inches per animal for t and outlet.

of opinion that in sheds which are continuously a much larger ventilating area must be secured with by means of louvres and shutters for varying both the outlet areas, depending upon the foulness and heat of e air and the position of the wind and temperature of ide air. To this end ventilating openings should be n the roof and in both the front and back walls of th means for closing such apertures in rough weather indy side and of opening them on the lea side.

esired to secure adequate movement of fresh air at the ve the floor at which the animal is breathing—*i.e.*, wo feet of the ground; but it is not generally per- to put the inlet openings at so low a level as this; in and protected places can they be allowed. It is ly essential to protect a milking cow from cold currents draughts; if such impinge on her, she will probably develop mammitis or contract a "chill." The best for the inlet openings is in the outer walls about six n the floor. Almost any opening will do, but its floor slant slightly upwards toward the shed, and its size made capable of regulation. Perhaps there is no han an opening of three feet long by two feet wide, ith a glass window frame, opening at top and bottom ntral pivot.

In practice drain pipes inserted, or angular openings in the brickwork with their base to the inside of the shed, answer well. Such are usually stuffed with straw in cold weather; not an objectionable proceeding, provided its removal is not neglected. The cold air admitted by these wall openings will fall to the level of the cattle.

All windows to sheds should be made to open widely, and the external doors should be half doors, so that the top may, if need be, be kept open night and day. Half-open sliding doors are draughty, and cannot be too strongly deprecated.

To provide for roof ventilation no loft or ceiling must be allowed, the roof itself being made of slates or tiles; best of all, of red pantiles, fitted to the rafters by pegs and without mortar. The interstices in this kind of roof allow of the escape of air, and the inflow of water is prevented. Corrugated iron and wood covered with felt are objectionable roof materials.

High up on the walls, or better still, in the roof—or if it be a span roof, at its apex—special outlets for the egress of polluted air must be provided. Perhaps nothing is better than a wooden chamber or dome with louvered sides running along the whole length or a considerable portion of the apex of the roof, such chamber opening directly into the shed, and capable of regulation by shutters worked with pulleys and cords.

Open fanlights in the slant of the roof have the objection that they admit rain.

Whatever the form of roof ventilation it must admit of regulation so as to prevent down draughts in certain positions of the wind.

As a rule cowmen keep their cattle in too polluted an atmosphere. It is not only necessary for an Inspector to see that means of ventilation are provided, but it is also necessary to ensure that such means are taken advantage of.

For the profitable production of milk it is necessary that cowsheds should be kept comfortably warm, an internal temterature of 58° to 60° F., combined with a fresh and sweet atmosphere is the desideratum. In cold weather if anything like one thousand two hundred cubic feet for each cow is insisted upon the sheds will have to be artificially warmed.

It has been suggested that cows should wear rugs as is usual with horses, I have seen it tried but they soon make them foul with their droppings that their general use is impracticable.

A cubic space of at least 600 feet should be provided for every cow, in calculating the cubic space the height of the shed above fourteen feet should not be taken into account.

The provision of ample cubic space and ventilation is not in itself sufficient to prevent the spread of tuberculosis. In a well

well ventilated shed having an air-space of 1,200 cubic
:ow, seven out of twenty cows which had been tested and
l free from tuberculosis showed a re-action when again
.t an interval of less than eleven months.

ecure the continued freedom of a herd of cows from
losis, efficient ventilation, constant supervision and
t testing with tuberculin is essential.

ashioned town cowsheds used purposely to be kept in a
semi-darkness, the idea being that cows after a meal
iickly lie down and rest, and that under such conditions
uld be more profusely secreted; now however, the pres-
light and sunshine is recognized as essential to the
nance of a high standard of health.

value of a particular window depends on the access of
it, in a shed unsurrounded by trees and other buildings
found a window space equal to one-thirtieth of the floor
the shed gives ample light to the interior.

important that dark nooks and corners where cobwebs
t might accumulate should not be allowed.

heds may with equal propriety be built of brick, stones
. If the latter, a brick or stone base of at least four
uld be insisted upon, the lower portion of all walls for
et on their inside should be coated with a cement to
an easily washable surface, this should not be lime-
but all portions of the walls above this should be lime-
three or four times every year.

Staffordshire bricks, red bricks set on edge, concrete
with cement and furrowed to prevent slipping, all make
ipervious floors.

me districts it is customary to make the floor of the
g of chalk for about three feet from the manger, this is
o the knees and brisket of the lying down cow, and is of
ge where bedding material is expensive, but it has the
n that it cannot frequently be washed and is a source
.

or covered with cement is cheap, durable and easily
d; but the material of a floor may vary so long as it is
y set and arranged for efficient drainage.

design of the floor is important, the best form of floor
of a depth of from five to six feet from the front of the
for the cows standing, then, arranged transversely to
nding, should come the manure trench, a channel from
to eighteen inches wide and four to five inches deep,
hroughout of the same material as the floor. This trench
he reception of the fœces and urine, and is so arranged
iese excreta should drop directly into the channel and

not on to the standing place, so keeping the hind quarters and udder of the cow out of the filth.

The floor of the standing should have a fall from the manger to the manure channel of an inch, and the floor of the channel itself should have a slight fall outwards so that the urine gravitates to its outer edge, the channel should be carried from one end of the shed to the other, having throughout a slight fall to its outlet, should go through the external wall and discharge on to a proper gully.

This channel drains off the liquid and permits of the easy removal of the solid portions of the manure.

At the back of this channel comes the milking passage, which should be at least five feet in width.

The cow standings should be slightly elevated above the passage.

The standings may be arranged for one or two rows of cows. In a double shed, *i.e.*, one containing two rows, it is important that the cows should not face each other, their tails should be towards the central line of the shed.

The mangers may be set close to the walls, or at a distance of about four feet six inches from them; this forms a feeding passage in front of the manger, which is, however, of greater utility as an aid to ventilation.

Perhaps the best kind of manger is the half-round salt-glazed pipe, set in brickwork with cement, not more than five inches above the floor and running the whole length of the shed. It forms a continuous manger, not sub-divided for different cows. At its lowest point is a channel controlled by a plug leading to the manure trench. With such mangers cleanliness is easily secured.

Mangers of iron or of brick lined with cement answer very well.

At two cowsheds within my district no mangers are used, the cows are secured in their stalls by the neck-trevis or clapse, and their food is placed before them in heaps on the floor of the feeding passage; after each meal the floor is swept. Very little hay is used, but such as is given is also placed on the floor. It is altogether the cleanest method of cow-feeding that I have seen.

Standings or stalls are made to accommodate a single cow or two cows. Both the single and double stall systems have their advocates. I prefer the double stall.

A standing for two cows need not be more than six feet six inches in width; two cows will stand and lie very comfortably in this space. If more room is allowed the cows will stand across the stall, and their droppings will fall on to their beds.

vidth of a stall for a single cow must be at least three inches.

depth of the stall from the manger to the manure should be, as I have previously pointed out, from five eet, the depth of the standings varying in each shed so commodate cows of different length.

a frequent custom to put the mangers close in to the id so to tie the cows with their heads to the wall; cally this is wrong, but in practice, provided ventilators ed about 3 feet above their heads, it does not appear rmful or conducive to the spread of disease.

inary surgeons know that the infection of pleuro-nia, eczema epizootica, and probably also of tuberculosis o often conveyed by the diseased cow to the nearest as to others farther away, it is a well-known fact that earliest detected cases of disease frequently occur in laced at different extremities of a shed.

re cows are watered in their stalls directly from a main a cistern, an iron or zinc gutter, about 9 inches wide, bout 18 inches above the manger, and running the ength of the shed is a good plan, the water being turned is gutter twice daily. Occasionally the continuous , such as I have described, is used for both feeding and g.

or zinc vessels, one to each standing, continually filling trolled by a ball-tap and cistern inside the shed, answer it require much looking after to keep them clean.

e is some advantage in watering cows outside their shed, ight being turned out together for that purpose. Should g be amiss with any cow it is more noticeable when she also a fresh supply of air gets into the standings when e unoccupied.

e is no risk to the animals' health, even in the worst winter, by turning them into a yard to drink, provided e not kept out very long. Water should be supplied in , cows should not be allowed to drink at ponds which become foul from their evacuations, not that water so s injurious to the health of the cattle or that the drinking fects the purity of their milk, but dirty water or water inated with faecal matter splashing on the udders or ay find its way to the milk pail.

ire water supply for the purpose of cleansing the milk is of greater importance than the purity of the water d to the cows themselves.

shed with its floor made as I have suggested no covered eed be in the building. All urine and liquid filth is carried to the outside of the shed by the manure channel and is discharged on to a proper stoneware gulley, of sufficient size, connected to a drain leading to a cess-pool or sewer. Such drain should be properly disconnected by means of an interceptor, provided with a sweeping arm. Provision must be made for the inlet of fresh air, and at the head of the drain a ventilator of a diameter of at least four inches should be carried to a point above the ridge of the shed.

The best bedding material for cows is wheat straw. In districts where straw is very dear fine wood shavings or sawdust, although of low manurial value, are clean and efficient substitutes.

Peat moss litter has the objection that it always looks dirty and is apt to block drains.

To "muck" a shed out twice in twenty-four hours is not sufficient, it should be done oftener, and as necessity arises in the working hours, but it must not be done when the cows are resting, to disturb them at this time, diminishes the milk yield.

Sufficient attention to the grooming of milch cows is not usually given. The teats and udders should be washed before each milking, and the bodies of the cows cleaned every day. Many owners object to their cattle being washed. At one shed under my supervision the hind quarters of the cows are washed daily with cold water, no colds are caught or chills taken in this process, and the appearance of the cows is immensely improved thereby. It is very necessary that the milking stools should be washed frequently, the milker is continually handling them, and if dirty, they foul his hands which are to be immediately engaged in milking. Cow-pox may be spread from a diseased to a healthy cow by means of a dirty milking stool, probably contagious mammitis of cows would be also so conveyed from animal to animal.

Normal milk within the udder receptacles of the cow is practically sterile. With the intention of limiting, as far as possible, the access of bacteria to the milk a piece of clean linen or a fine strainer covered with a layer of cotton wool put at the top of the pail during the process of milking will be found to much lessen their number. With the same end in view the shed-floors should be washed daily with clean water, and no poultry, horses, or pigs should be kept in the cowshed, the manure heap or receptacle also should be quite 40 ft. from the door of the shed, and grain pits having impervious sides and bottoms should be outside the shed and so arranged that the effluvium from the grains does not gain access to it.

Much of the subject-matter of this paper could have been more efficiently dealt with by an architect.

e control of our milk supply cowshed inspection is very
r. I have already alluded to the necessity of the use
vater for the cleansing of milk vessels.

g in mind that milk is so frequently contaminated with
s of disease after leaving the cow, it is obvious that
th of cowmen and their families is of paramount im-
, but hardly less important, if at all, is the condition
ealth of the cows themselves.

issue of model bye-laws for the use of local authorities,
he Dairies, Cowshed and Milkshops Order of 1885,
is made in Article 2 for the inspection of cattle in a
the medical officer of health or inspector of nuisances,
tion is made of inspection by veterinary surgeons.
zing the responsibility of the position of medical officers
h, no one can suggest that dairy cattle should not all
open to their inspection.

e other hand, it is difficult to understand why inspectors
nces should be inspectors of cattle. We see announce-
local newspapers of sanitary inspectors being appointed
rs under the Diseases of Animals Acts, 1898.

told that the duties of an inspector of nuisances or
inspector necessitates his attendance at all outbreaks
latina, diphtheria, and other infectious disease in his
that he has to supervise the disinfection of, or himself
fect the apparel and bedding of the patients, to super-
their removal to isolation hospitals, and pay frequent
those institutions.

incredible that any gentleman who has these important
to perform can properly be in any way associated with
duction and distribution of milk, a fluid which is at all
eady to absorb disease germs, and which forms such an
nt medium for their growth, multiplication, and eventual
tion.

recognise the existence of disease in a cow, and to
ly estimate its importance to the public health, requires
ial training only acquired by years of study. Some
dge of bacteriology, skill in the use of the microscope,
ove all, an actual practical experience of the details of
ily life of dairy cattle are essentially necessary. I
e to think that such a combination of scientific know-
and practical experience is but rarely found, except in
ers of the veterinary profession, and I confidently antici-
hat the day is not far distant when all local authorities
umber amongst their appointed officers a duly qualified
inary Inspector.

Mr. T. B. **Pease Ford** (Bentham) said the question arose how the suggestion laid down so carefully by Mr. Villar could be carried out. He might be in error, but he thought the present Cowshed Act was not compulsory on all rural authorities, and until that Act was made compulsory he failed to see how much could be done to check the disease, and if that Conference had any power by raising its voice to help to bring about such a result it would be rendering a good service. He trusted that something would be done in the way of compelling rural authorities to put these Acts in force, and that they should be compelled in all cases to periodically inspect all cowsheds in their districts.

Mr. S. H. **Slocock** (Hounslow) congratulated Mr. Villar on the excellence of his paper and on the ideal cowshed he had put before them, and said that he was sure that all who had listened to that gentleman must also do so. He had shown them a cowshed as it should exist. He thought that the three most important essentials were light, ventilation, and a good supply of pure water. He did not agree with the excessive amount of cubic space demanded by many local authorities. He considered that cows stood better in pairs than singly, and did not require much tieing-up room. They found difficulty in getting owners to erect the ideal sheds, and he thought that many of the existing sheds which had previously held, say, twelve to fourteen cows might, instead of being condemned, be easily improved in the matter of light and air to still hold the same numbers.

Mr. T. B. **Goodall** (Christchurch) said as to the tying up of cows, in his district they had no separate stalls at all. They were open sheds from end to end, and that seemed to be very healthy. In nearly all their dairies there were flaps or drop doors behind the cows, and just under the eaves of the sheds, and these can be opened or closed. In warm weather they were let down open, and in cold weather closed. A chalk floor was one of the best floors they could have, both for stables and cowsheds; the cow did not slip, and it was an excellent absorbent, and it made an excellent manure for the land when done with. No doubt it was well to let the cows out during the afternoon. The seeing to the washing of the teats was impracticable at present, as the cows were generally milked about two o'clock in the morning. He remembered an instance of two cows becoming very ill and dying through drinking out of a well which received soakage from a farmyard, and another case in a very dry season, some years ago, when a ditch was contaminated by what poured into it from the cess-pit of a cottage; some cows drank the water, and this was the cause of a serious outbreak of disease among them.

Prof. F. T. G. **Hobday** (London) said Mr. Villar had urged the necessity of efficient ventilation. A little while ago he (Prof. Hobday) was away testing a number of cattle. There were eighty

ttle in two very large sheds. The sanitary arrangements
ery way perfect, and it was a model cowshed except with
ventilation. He went in about nine o'clock to look round
ing the temperature of the cows, and found that it was
at it almost took one's breath away to get inside. The
re was nearly 80°. The cattle looked in the pink of
but over 40 per cent. re-acted to the tuberculin test
ent hops were obtainable at a comparatively cheap price, he
hey were more cleanly than straw for bedding purposes.
ng seemed sweeter than when straw was used. He should
Mr. Villar whether he did not consider it better to put
comparatively small sheds, rather than to put forty beasts
ther in one shed? If tuberculosis got rife in a large shed
ly to cause a great deal more loss to the owner than if the
ere kept in fewer numbers in comparatively small sheds.
articular sheds he referred to, the cattle were put face to
he observed that where an animal was tuberculous the one
on the opposite side frequently reacted to the tuberculin

G. Davies (Swansea) said he was called in to see some
en he found the ventilation was very far from what it
ve been. The walls were quite damp, and in fact ventila-
bsent altogether. He mentioned the fact to the owner,
her pooh-poohed it. Shortly afterwards he was called in
to a case of a similar character, and the owner on being
to do said, "I cannot go to the expense." He (Mr.
ggested to him that he should write to his landlord, but he
to write to the agent. He did so, and the result was that
me an improvement was made in the shed, which quite
e condition of things. He (Mr. Davies) pointed out the
e of tuberculosis amongst his stock, but he would not hear
the animals at all. His objection was that people would
hat it was, and that if milk was sent into the town they
ect to drink it, as they might think that if the cows were
he disease might be communicated to them. Amongst the
died there were signs of tuberculosis, and no doubt the
entilation aggravated the mischief. Touching upon bedding
en sand used, and though he anticipated that there would
jection raised to it, he thought that there were places,
near the sea-shore, where it could be got plentifully and

l Jones, V.C. (Finchampstead), said he agreed with Mr.
aper with one or two exceptions. One gentleman went
an the writer and proposed to have two cows together, but
el Jones) went for putting a dozen together in a row. He
at cows did admirably well under such conditions. Then
preferred to have a wall 4 ft. 6 in. high, which would prevent
th of one cow coming in contact with that of another,

because the breath had to be taken up before it could come over the wall to the other cow; whereas by the other method which had been propounded, they would have the cows coming in contact with one another. Moreover, what he proposed would do away with the disadvantage of the head to head arrangement. With regard to the appointment of inspectors of nuisances to inspect cowsheds, he thought that should be done by those holding veterinary diplomas, so that they might have thoroughly qualified persons to deal with the cowsheds.

The President of the Conference (Mr. W. Hunting) said people were often misled with regard to the prevention of contagious disease by mixing it up with the larger question of general hygiene. They remembered that not long ago the Queen's herd of forty cows were tested for tuberculosis, and 90 per cent. were diseased, but he took it that they were kept under perfect hygienic arrangements. They must treat contagious diseases of animals, directly and immediately, by measures directed to the carriage and transmission of the contagion, and not indirectly by improving the general hygiene and sanitation.

Mr. Sidney Villar (Harrow) then replied to the discussion on his paper. Mr. Slocock, in regard to the question of ventilation, said that he did not think that a space of more than 600 feet of air for each cow should be insisted upon. Now it seemed to him that there were some very hazy ideas regarding the quantity of air which all kinds of cattle should have. Quite recently he was looking at a sort of text book for engineers and builders, and there it said that the quantity of cubic space in buildings for horses and cattle should be 3,600 feet for each animal. He pointed out in his paper that 1,200 feet could not be insisted upon, because even if they had that space they must artifically warm the cowshed, either by fires or hot-water pipes. He did not think that any one would advocate that their cows should be kept in a temperature artificially warmed as if they were hot-house plants, for under such conditions they would be increasedly susceptible to all kinds of disease. Captain Moore made some remarks to the effect that they might so arrange and keep their cowsheds as to do away with tuberculosis, but he (Mr. Villar) had pointed out that the sanitary arrangement of a shed was not of itself sufficient to eradicate this disease. Ventilation was perhaps the most important factor in cowsheds, but it was not a cure for all diseases. He mentioned a case where a very large proportion of the animals became infected with tuberculosis through one diseased animal being brought into a shed, although the air space in that shed was 1,200 feet to each cow. Professor Hobday suggested that the herd should be divided, which would be a very good, though a very expensive, thing; indeed, the expense would be something enormous. He was very much obliged to Col. Jones for his observations, who suggested that the cows should be tied. Cows, he said, should be tied head to head and have a wall 4 ft. high between them, which he

) could not agree with. A wall 4 ft. 6 in. high would be ing to prevent proper circulation of the atmosphere at the iich the animals breathed. The great idea was to do the stalls and get a free circulation of air. Mr. Slocock owkeepers in the country, but why did they go there? the reason that they knew that if they went there l not be looked after, and their sanitary arrangements be superseded by other and improved methods, and keep their cows in any condition which they considered rable to the making of money. Mr. Goodall said it was to wash out the cowsheds, and as to the washing of being seen to, no doubt it would be a good thing if it irried out. He (Mr. Villar) advocated it, but how could t carried out at two o'clock in the morning, especially time? Then it was said that cows fed on a sewage e there was some highly contaminated sewage, were it he had many a time known of cows drinking impure out suffering from it at the time, and there were times drank water contaminated with sewage without suffering cts therefrom. Then as to the cleansing of milk vessels, f cases where diseases arose from the vessels being imeansed. With regard to spent hops, no doubt they made l bedding, the cows eat a large quantity of them, and it ect the milk in any way. As to the question of ventilaows being tied head to head, as far as his (Mr. Villar's) is went, cattle tied in that particular position, even ace of four feet between the rows, seemed to be more than when tied with their tails towards the central line. ertain that the space of 2 feet between rows of cows as by Professor Hobday would be decidedly wrong. Captain ke of ventilating apertures, 18 inches above the floor. That do, for draughts blew in and affected the cow in her eptible organ—her udder. A gentleman asked how the is of his paper were to be carried out; he took it, the only s by special legislation. He, the gentleman referred to, had enough to say that he would propose a recommendation to , and he (Mr. Villar) thought they would be doing the best l to enforce such regulations being adopted if they supported s action, by so doing they would be doing all they could to ie existing evil state of things.

ution was then proposed to the effect "that the provisions iries, Cow Sheds, and Milk Shops Order should be made ry upon all local authorities, and that the Government urged to undertake a scheme for the reduction of bovine sis."

"*Diseases of Cows, which are communicable through their milk to human beings*," *by* HAROLD SESSIONS, F.R.C.V.S.

ABSTRACT.

MILK is a substance in which many bacteria rapidly multiply and thrive. If the milk happens to come into contact with any bacteria in which it is a suitable medium for them to multiply they quickly do so; and if the bacteria are pathogenic the milk at once becomes dangerous as a food.

The principal diseases which have been stated to be common to human beings and cows in England, are:—rinderpest, foot-and-mouth disease, anthrax, tuberculosis, scarlatina, diphtheria, typhoid, rabies, tetanus, cow-pox, small-pox, actinomycosis, ringworm and diarrhœa.

Several of these diseases we can dismiss with a very short reference. **Neither foot-and-mouth disease* nor rinderpest at present exist amongst cattle in England. Both diseases are stated to be transmissible from cattle to human beings, but only in rare exceptions, and the results do not appear to have been fatal.

Although both rabies and tetanus are diseases which occur in cattle and human beings, there is only a very remote possibility that they could be conveyed to human beings through the agency of the milk.

Anthrax is a disease which is fairly common in cattle, and is one which under certain circumstances might possibly contaminate the milk. A special feature of anthrax in cattle is that the disease is so acute that affected animals usually die in the course of a few hours. Experiments also show that the bacteria which are said to be the cause of anthrax cannot be demonstrated in the bloodstream of affected animals until a short time before death, and we may presume that such is the case with regard to milk. Immediately after death, if a little milk is drawn from the udder and examined microscopically it will be seen to be teeming with anthrax bacilli.

Ringworm which affects both cows and human beings is not likely to be conveyed in the milk, and if it is, it is quite the exception, and there is no record of its ever having been carried in this way.

In some parts of England cases of actinomycosis are comparatively common in cattle. There are a few cases recorded in

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* Since writing this article an outbreak has occurred in Norfolk.

ings; but there does not seem to be any suggestion
ontagion is ever conveyed from the milk of a cow,
it has been suggested that the disease might be con-
ough eating the flesh of affected animals.
se which is far more serious than any of those we
tioned, both to human beings and to cattle, is tuber-
Experiments which have been made show that when
dder is tubercular, and the milk is fed to calves,
ther small animals, in the course of time they too
fected with the disease, and although we cannot carry
direct experiments on children, the circumstantial
s so strong that we may rest assured that the disease
ven to them in the same way. On the other hand, it
demonstrated that although a cow may be affected
culosis in the thoracic or abdominal organs, so long
der is free from the disease the milk may be fed to
s, or guinea-pigs with immunity, and we may presume
ildren. The danger then which we have to face is
cows which have tubercular udders.
the whole of the agricultural and veterinary world
led by being told that an outbreak of scarlatina had
mongst cows in Hendon; and during the next year
umber of experiments were carried out, particularly
ein, to try and prove that cows naturally take scarlet
yond this supposed isolated outbreak at Hendon there
enticated instance of scarlatina attacking cows; and
ere can be no doubt by any one who has carefully
e whole literature with regard to the Hendon out-
particularly Sir George Brown's masterly summary,
ows never suffered from scarlatina at all, but that the
ontaminated from extraneous sources and in that way
the infection.
ria too is a disease with which the cow has been
ut here again authentic data is wanting to show that
suffer from the disease.
x is a disease which is easily passed from cows to their
nd although in old days the milk must frequently
contaminated from the running sores in the cows'
ng the milking, I do not think there is any evidence
disease has been communicated to human beings
he cow's milk, though I am quite prepared to hear
y be, and that it has produced disease which may have
sed under some other name that has not been recog-
uman beings.
ly we have seen it stated that a specific bacillus has
nd in the milk of some cows which produces diarrhœa

in children, and it is suggested that this bacillus is derived from the cow's body. Whether it may be so or not I think it is too early to say. It is a well-known fact that a very little contamination in the milk drunk by young children who are being hand-reared, is quite enough to seriously upset them; and when we remember that the milk is very often mixed before being sold to the consumer, and that the cow's food is frequently changed in the hot, dry weather; independently of any specific bacillus, I think there is quite enough to upset children.

Besides these specific contagious diseases which we have referred to, there are several diseases of the udders of cows caused by cold, septic infection, injuries, etc., which render the milk unfit for human food, and it certainly is not advisable to use the milk from the cows whose udders are not in a normal condition.

Mr. S. H. **Slocock** (Hounslow) said he had heard milk mentioned as producing diarrhœa in men and children. Now, he thought it was a pretty generally accepted opinion that healthy milk was binding rather than otherwise in man. He thought it affected people in different ways. They found milk a very relaxing food for dogs and any small animal—that was healthy milk. As to diseased or contaminated milk, they would naturally suppose it would produce diarrhœa in the animal. The milk from an animal affected with cow-pox has been mentioned as not producing the disease in man, but he thought it was pretty generally accepted that the milk from such cows would produce a febrile affection in children, accompanied by a sore throat. It was but a small affection, and caused no great harm. Then the question of the milk of two of the quarters being healthy and that from the two other quarters being diseased was mentioned. That milk, provided the cow was tuberculous, should not be used. A very common practice had been to allow the calf to suck from the affected quarters, and the calves took a lot of milk which was not considered quite fit for human consumption. He believed that in the majority of these cases the cows were affected by tuberculosis, and if affected with it, there was an easy means of transmitting the disease to the calves.

Mr. **Skelmerdine**: Did you ever have any cases where the calf was affected with tuberculosis?

Mr. **Slocock** could say that in cases he called to mind he traced the tuberculosis. The calves were fattened and killed young, and he did not know that they had the chance of finding out whether the calves were affected with tuberculosis or not.

RESIDENT OF THE CONFERENCE (Mr. W. Hunting): Their e is insufficient. Such cases do occur, although rarely.

L. BUTTERS (Paddington) said he recollected over twenty being called to a cow suffering from rabies. She had been lk when observed ill and as an experiment some of the milk to the dogs, with the result that none of them suffered es. He thought that as far as rabies was concerned, the he cow was perfectly harmless and did not communicate e. Now as an illustration of tuberculosis in calves from nilk, a gentleman who kept a couple of Guernsey cows for f the house. He (Mr. Butters) was called to attend to one ws shortly after it had calved, but he could not exactly the nature of the disease, as it occured many years ago. vas sucking the cow when she was taken ill. The cow not in a week or two was killed, when a post mortem on revealed very extensive tuberculosis. None of the ffered from drinking the milk as far as he had heard, but cular calf shortly after the death of the cow died too, and rtem revealed that the lungs were full of tubercles. They large but they were numerous. It was thought that when uffered from tuberculosis that heredity played the part of g the disease, yet after looking at the matter in the light , they discovered that the calf imbibed the bacillus from

B. GOODALL (Christchurch) said he gave a hint on the day that other diseases besides tuberculosis and diarrhœa conveyed through milk, especially to children. With diarrhœa he could speak from experience, and to how much to the way in which cows were fed. In the winter time d principally on roots, which caused diarrhœa in children. ld of his own he had to get a special cow, keep her at home her on dry food, and only by this means could he check a me diarrhœa. Then he thought that cow-pox was conveyhe milk to the human being. He had a case now in his ere he was consulted by a medical gentleman, concerning an where the children and the servants of a house and the the lodge gates were suffering from ulceration of the throat. mined the cows they were then milking, and they were be suffering from ulcerated teats. The milk was stopped, hildren and servants got better. Another case happened nths ago in which four men had such bad arms and hands, milking cows affected with cow-pox, that they were laid up d not work, and this was certainly brought about by direct on.

. VILLAR (Harrow) said it had been correctly pointed out largest number of diseases communicated through milk were ved from the milk itself, but were due to its contamination after it had left the cow. References had been made to the historical case at Hendon just fifteen years ago, and he (Mr. Villar) was in the unique position of seeing those cows whilst they were affected, though many veterinary surgeons saw the cows after they had recovered. The opinion he then formed was that the cows were suffering from cow-pox; indeed, there was absolutely no doubt about it. There was very strong evidence that in this case the milk was contaminated after it had left the cow. Within a short distance from the Hendon farm were premises inhabited principally by laundry people, and some of the workmen employed were in the habit of going backwards and forwards from a thickly populated place where scarlet fever existed to the cowsheds, and the result of investigations proved that the scarlet fever which broke out did not arise from the cow. The history of this particular outbreak was—a dealer bought a number of cows in Derbyshire, and they were sent to Derby market. They were brought to Middlesex (he thought there were about sixteen of them), and were divided into three lots, and sold to three different cowkeepers. There was no doubt that each of the cows developed cow-pox, but it was clearly established that this had nothing to do with the outbreak of scarlet fever at Hendon, as the consumers of the milk from the other two lots of cows did not become affected with that disease.

Mr. E. **Whitley Baker** (Wimborne) said that some seven or eight months ago he had an outbreak amongst a number of cattle. There was one man whose hand became poisoned thereby, and who, in fact, became incapacitated. The poisoned hand, produced by the poison of the udder, caused a condition which, as far as he could judge, was very alarming. It appeared to him that it would be as well if the government, in their wisdom, in appointing the local officers of health as inspectors of dairies, would also include the inspection of the condition of attendants on the animals. He went to attend upon one dairy where a dairyman had been milking, and what most of all struck him was the condition of the man's hands. What the man had been doing before milking he did not know, but he thought in 99 cases out of 100, neither one of them would like to eat pastry made by the hands employed as before-mentioned, without their having previously been washed, and yet they all of them consumed milk drawn from the cow without the exercise of these precautions.

Mr. **Philip W. G. Nunn** (Bournemouth) said that as a Medical Officer of Health, he took great interest in the work of veterinary surgeons in any locality, and he ventured to say that this work in respect to dairies could not be done in its completeness unless the authorities had the assistance of such an officer. In the borough for which he had the honour to act as sanitary adviser he believed the council were fully alive to the importance of this. Immediately after reading the report of the Royal Commission he had made it his business to bring before his authority the necessity of having

an inspection of dairies as was possible. One of the
was that all the farms supplying the purveyors were
e borough boundaries. It was desirable to make these
s compulsory. Rural sanitary authorities, as a rule, were
en in this direction as were the authorities in the larger
d certainly not so particular as it was necessary to be in
ant health resort—he had, however, always found purveyors
rs willing to take advice and adopt, as far as possible, any
autions which may have been suggested to them. There
ubt that tuberculous disease could be transmitted more
from an infected milk supply than in any other way. The
is opinion, was not far distant, when this source of in-
ll be rendered impossible in all well managed dairy farms.
re many dairies in this country that certainly were not
ooked after; as a rule he had found the larger dairies better
han the smaller ones. Now, as to diarrhœa, there was no
the sudden change in the feeding of cows often caused
estinal trouble in children. One thing he had proved for
s that if cows were suddenly changed to rye grass, ten to
at the milk from such cows would upset young children.
regard to some other special kinds of feeding. If cows
nto damp pastures near a river liable to fluke disease, no
cows would suffer as well as the sheep. Some gentlemen
sending in milk from cows five days after calving. He
at was too early. If he were the proprietor of a well
lairy and he wanted to be sure his milk was properly safe,
xtend the period to ten days instead of five.

or A. **Skeldmerdine** (Liverpool) said that in New York
regulations were very rigorous, the length of time required
rd of Health was only three days. He was surprised to
Goodall say that diarrhœa was principally caused through
months by the eating of dead leaves and so on. Now at
they had some 6,000 cows tied up and also about 6,000
ng in milk from the country. Their experience showed that
he summer months that it was so prevalent, and the health
felt that diarrhœa was not caused entirely by the milk from
but rather from the carelessness of parents in the poorer
f the city, in not taking proper precautions in regard to the
after receiving it.

Villar (Harrow) said that his suggestion that milk should
ed for a period of five days after calving was founded on
hat he found that when the milk was separated by a cen-
parator, there was a considerable increase of slimy material
k for five days, and supposing the milk of the cow was put
glass vessel for four and twenty hours, there was usually
blood tinged deposit from the cow. He could not see
xperience in regard to New York affected his argument.

The President of the Conference (Mr. W. Hunting) said it was a very curious thing in reading Mr. Sessions' paper to find that he referred to the disease of tuberculosis as being one not found among animals which had lived for generations in the open air. The faith in ventilation and open air he thought was having too much run. There was a fallacy about the matter. They might as well congratulate sailors upon their freedom from railway accidents because they were on the ocean. There was no virtue in the open air except that the tubercular bacillus did not happen to be there until carried by a diseased animal. As to the diseases derived from the milk of the cow there was apparently only one—tuberculosis, and one other condition which they did not know much about, which produced diarrhœa. They must confess that the small dairy was not the perfection of sanitation, and they could not tell what mischief was wrought by dirty hands, dirty heads, and ulcerating sores. He was not surprised that the Medical Officer often got a little more strict than he ought to be when he found all these dreadful things. Mr. Villar had pointed out a number of things that affected cows after calving. There was changing the food, and that went to alter the milk. It was said that mixed milk had some disadvantages, but it seemed to him that the argument was the other way. Out of 100 cows in a shed, many of which had not been suffering from tuberculosis or other disease, there was a yield of 99 per cent. of good milk, and so the infective milk was well diluted by mixing. He thought that all they had to do now was to look forward to their next meeting.

CONGRESS AT SOUTHAMPTON
(*Continued*),

RENCE OF SANITARY INSPECTORS.

eedings of the Conference commenced with an address
ie President, C. MacMahon, Chief Sanitary Inspector,
uay, which was published in the Journal, Part III.,
XX.

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anting of Sanitary Certificates by Sanitary Authorities,"
. E. **Hudson**, Chief Sanitary Inspector for the Borough
heltenham.

(Associate.)

ABSTRACT.

tom of granting Sanitary Certificates for effective
iitation by Local Authorities through their officers
successfully followed by several of the more fashion-
ential towns for some years past. Opinions differ as
dvisability of Sanitary Authorities granting these
s, and of putting this responsibility upon the Sani-
ector.

ents that have been advanced against the practice:—
rt of the duties of an Inspector of Nuisances as laid
the Local Government Board. Inspector should con-
elf to the duties prescribed by the Legislature. That
ice must create much feeling and friction between the
uthority and those who in one way or another are
i in the properties dealt with, or who have interested
es in the granting of certificates by private persons.

ents in favour of the practice:—Although not provided
egislature, or included in the "duties" of the Local
ent Board, yet the work is a proper one to be done by
ry Inspector. These certificates are a desideratum,
being the case, the Sanitary Authority is the proper
grant them. The certificates granted by private firms
eers, &c., cannot have the same authority, or be so
le to be affected by personal interest as those granted

by a public officer who has no personal interest and no private purpose to serve. That this duty requires the knowledge of a Sanitary expert to be satisfactorily done, and therefore is more likely to be well done by a Sanitary Inspector than by others whose qualifications and responsibilities are less certain. The granting of these certificates is germane to the work of the Sanitary Inspector, which is more than can be said for many of the duties which he is now called upon to do—such as a school attendance officer, petroleum inspector, &c. That it is a great boon to the public, both to the tenants and landlords of houses, that an official certificate should be obtainable.

Length of time for which a certificate should be held good—should an annual renewal be required, or renewed after a short period of years?

The method of procedure in regard to the granting of certificates varies slightly in different towns; our method at Cheltenham is as follows:—

The interested person makes his application and pays his fee. The Inspector then visits and examines carefully into every detail of drainage, water supply, and the rest; tests the drains, soil-pipes, &c. If any alterations are required, these are specified, and, if they are carried out to the satisfaction of the Inspector, a certificate is granted. Thus, whether the certificate be granted or not, the applicant has the benefit of a good sanitary report as to the condition of the premises.

This system has been the means of bringing to light gross defects, the existence of which were an undoubted menace to life and health.

The holding of a certificate improves the chance of letting a house; so much so, that owners of property have been willing to put themselves to considerable expense to obtain one; and it is of great advantage to lodging-house keepers, new settlers, and others in search of a new house, as it is possible for them to make it a condition of their lease that the Corporation Certificate shall be obtained or renewed as often as need be.

In some towns a small fee is charged for inspection and report; in others the Authorities have evidently taken a larger view of their sanitary functions, and considered it best to put no such tax on good sanitation.

The system of granting certificates appears to have been adopted through the demand of the public, and is a success. It has been the means of raising the standard of work all round, and has caused a large amount of voluntary sanitary improvements in dwelling-houses which could not have been effected by compulsory means.

I strongly advocate the adoption of the system of voluntary

n for private houses; but in the case of hotels,
ouses, and boarding-houses sanitary certification should
lsory. These remarks apply with special reference to
laces and health resorts, whither the public go in
health.

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rations by the Way. A plea for the Nationalization of
lth," *by* H. H. Spears, Chief Sanitary Inspector,
t Bromwich.

(Associate.)

s of Carlyle's "Sartor Resartus" will remember that
ed Teufelsdröckh was wont to retire to his private
the attic floor of the highest house in the Wahngasse,
m, sitting at ease, and alone with the stars, "he might
e whole life circulation of that considerable city Weiss-
',

will be many who would give much for some such
ity. To be able to detach oneself from the rapidly
ggregate of which one forms a part, to be able to gaze
e madding crowd" from afar; to view the path along
travels, and the goal towards which it tends, would
a desideratum.

are some of us, may be, in the sanitary army, who are
the noisy blare of the trumpets which are for ever
ing the triumphs of sanitary science, as exemplified in
death rates, public health legislation, and the gratifying
which attends congresses, conferences, and exhibitions
d with sanitation.

ven evince lurking scepticism when our honoured
who wear the blue ribbons of the profession,
tingly assure us out of the depths of their complacent
n, that things could hardly be arranged more comfortably
y are, and that we are rapidly progressing towards that
me when every unhealthy condition will have been
l; when nuisances requiring abatement will be non-
, and when the principal duties of the Sanitary Officer
to endorse the cheque for the monthly increment of his
salary, and to participate in the public festivals to
te his ultimate effacement.

may be so, but we are not altogether reassured. We
refer to retire awhile to some convenient spot, where,

secluded from observation, but commanding a full view of the route along which the sanitary army is marching, we could discern the relative degrees of strength or weakness exhibited by the imposing army, where we could estimate the difficulties besetting its path, and where we could tell as to whether it is taking the shortest of all possible ways towards the longed for haven.

But such a complete detachment is of course impossible. As long as we are *in* the world we must be *of* it; and with most sanitary officers the need for action is so immediate and pressing, that but few opportunities occur for the exercise of philosophical thought.

Still, on the other hand, one may occasionally indulge in a few empirical generalisations as to the present and future bases of sanitary administration; and it is with a view to eliciting the opinions of men whose ripened experience so well qualifies them to judge that the following "Considerations by the way" are formulated. They possess the two negative qualifications of being neither original nor practical, and the best that can be said for them is that they embody the personal convictions of one who has given some little thought to the questions at issue.

Not a few of them owe their inception to a recent perusal of the earlier "Transactions" of the Institute under whose auspices we are now assembled, and more particularly to a paper read at the York Congress (1886), entitled, "An Account of an Investigation into the Classes who administer the Public Health Acts."

It will serve no useful purpose to recapitulate the details of this investigation; suffice it to say that it dealt with the constitution of something like 200 Boards of Health, the summarised conclusions of the author being that nearly 84 per cent. of the number of those serving upon Boards of Health, who, "taken as members of classes, and considering their interest and fitness, either present a negative attitude or active opposition to the administration of the Public Health Acts."

It is scarcely necessary to add that these conclusions were not accepted with perfect unanimity; and "an unfortunate paper," "a burlesque upon self-government," "a diatribe," were some of the least scathing terms applied to the address in which they were included.

These descriptive appellations were possibly justified at the period at which they were spoken; but, reviewing the pros and cons of this ancient controversy, one is inclined to regard the paper as prophetic, if nought else, inasmuch as these strictures on the administration of Public Health law would seem to be especially applicable at the present time. It is perfectly true

number of devotees at the shrine of Hygeia has
never been exceeded, but it is highly problematical
bstantial progress in Sanitary Science is now being

r statistical proof in support of this assertion is, of
possible, but if it can be shewn that the forces which
retrogression are in the ascendant, or are gaining
à priori justification will be given to the thesis enun-

g in the first instance, then, with some of the more
actors, it cannot be too often insisted upon that the
to a greater or lesser extent of small property owners
governing bodies is a very serious matter in so far as
alth is concerned, and this the more because sanitary
re without any independent powers of action. In the
, at any rate, an officer has no legal right to serve a
ven, for the abatement of a nuisance. He can in-
and report, but the local authority are the sole judges
ther a notice shall be served and proceedings taken.
titute a comparison: A chief constable, be it of borough
y, is invested with powers of independent action to
considerable extent. It is not necessary for him to
ermission to prosecute in every instance from his
Committee, or Standing Police Committee, for every
ay of the licensing laws. It is perfectly certain that if
of Police had to obtain the permission of a committee,
l of brewers and publicans, before any proceedings
taken for opening during illegal hours, for permitting
g, etc., the administration of the licensing laws would
l, the reverse of satisfactory. Our enlightened public
uld be unsparing in its denunciations, and yet the fact
milar contingency is possible under the Public Health
cites no surprise.
onstitution of the local governing body becomes, there-
natter of serious moment.
s been laid down that licensing magistrates must not be
or indirectly interested in the preparation or sale of
c liquors, but no similar disability prevents persons
interested in the perpetuation of insanitary surround-
om being members of committees who alone have the
f putting the Public Health Acts into force, and some
ave actually known sanitary and health committees ex-
y composed of owners of slum property.
not, of course, contend that a member of a local author-
ssessing small houses is necessarily averse to sanitary
ements—far from it; but I do say that it is unfortunate

that private interests are ofttimes at variance with Public Health, and that a man requires to be possessed of a strong sense of duty to be able to assent to proposals which may involve him in considerable financial outlay.

Nor is the actual ownership of slum property the only factor operating to produce unwillingness to enter upon sanitary crusades. In most instances members number among their supporters or friends men of influence who own houses in an unsatisfactory sanitary state, and who are, therefore, able to produce arguments calculated to damp the ardour of the would-be enthusiast for Public Health reform, and where the offenders against the canons of sanitation happen to be occupiers, skilful agitation may deter many timid individuals from seeing that the law is administered without fear or favour. With all these subtle influences at work it is not surprising that the enforcement of the Sanitary Clauses of the Public Health Acts is to many members of Sanitary Authorities exceedingly unpleasant, and that it does not attract the highest types of our local legislators.

The Lord Mayor of one of our large cities remarked last year that it was the custom in his city to place all new members, in the first instance, on the Nuisances Removal Committee, the work involved being of the most exacting and distasteful character. To a man not fully conversant with the *raison d'être* of modern requirements, and lacking, therefore, that devotion to the sanitary ideal which alone redeems our work from its appearance of petty persecution, this cannot well be otherwise.

But, objects one critic, "Surely the recent reforms in Local Government, the improved methods of voting and democratisation of our institutions, will render it impossible for self-interested individuals to obtain seats on our local governing bodies; and a higher type of local administrator will necessarily be produced." Speaking broadly, I am rather afraid the reverse is the case."

It is true that in some boroughs peers of the realm have been chosen as Mayors, and, as we all know, Lord Rosebery has been elected a member of a District Council. It takes, however, "many swallows to make a summer;" and in some of the more flagrant examples of the types I have indicated the change in *name* from Local Board of Health to District Council has been the only change, the *personnel* of the members remaining the same.

On the other hand, in not a few instances, men of standing, culture, and refinement have been ousted, or have voluntarily retired, their places being taken by men of narrow views and of imperfect education. Without, however, laying undue stress on this aspect of the question, let us briefly refer to other and less obvious phases of our inquiry.

The establishment of Parish Councils was to have brought untold blessings in its wake. Laggard Rural District Councils were to be stirred into activity by the continued representations of the assemblages of villagers yearning for sanitary reform. This was the ideal Parish Council. The actual product is very different. In nine cases out of ten when the Rural District Council has propounded a comprehensive sewerage or water supply scheme for a given village, the Parish Council has vehemently protested and has sought to frustrate the scheme in every possible way. The verdict of officers in Rural Districts appears to be distinctly unfavourable to Parish Councils.

Another outcome of the Local Government Act of 1894, has been the creation of a large number of small Urban Districts, and this too is far from being an unmixed blessing. The untoward influences before referred to, operate even more markedly in a small district, and sanitary progress can be most effectively burked. The low rateable values preclude large salaries being given to Sanitary Officers, as such, and hence it becomes necessary, either that an officer shall give only a limited portion of his time to the duties of his post in return for a more or less nominal salary, or else that there shall be a combination of offices, one individual perhaps combining the respective duties of Surveyor, Sanitary Inspector, Rate Collector, School Attendance Officer, Vaccination Officer, &c. In neither case can the result be satisfactory as regards the work of sanitary inspection. It is only natural that a man holding the dual office of Surveyor and Inspector will prefer to devise sewerage schemes, rather than to estimate the cubic contents of an overcrowded tenement with vermin-covered walls.

It has been stated that the changes in titles from "Local Board of Health" and "Rural Sanitary Authority" to "Urban" or "Rural District Council" is often without significance in so far as the *personnel* of the governing body is concerned. In some respects, however, the change in name is portentous. The old appellations implied that the Local Authorities were mainly concerned with health and sanitation. The newer titles may include very much more. It is a mere commonplace to say that the functions performed by Local Authorities are daily becoming more numerous. When we see that comparatively small Councils are acquiring gas and water undertakings; that they hold provisional orders entitling them to manufacture electric light, to equip and maintain tramways—to say nothing of managing Free Libraries and Technical Instruction Classes

—it becomes apparent that the administration of the Public Health Acts by no means forms the staple business of a Council. All who are conversant with modern municipal work will, I am sure, bear me out when I say that infinitely more attention is given to what are termed remunerative undertakings, than to those which are concerned with sanitary reforms. The more cultured members of the various authorities naturally gravitate to the Free Library and Technical Instruction Committees; the shrewd men of business are to be found on the Finance, Gas and Water, Tramway and Electric Lighting Committees; consequently it becomes increasingly difficult to induce really first-class men to serve on the Sanitary or Health Committees. Of course, I am speaking in a broad sense only. Anyhow, it is a fact that what we have termed the remunerative undertakings are the most popular. When a committee can, with use of the intelligent ratepayer's money, produce an article for a shilling, sell it to the aforesaid intelligent ratepayer for eighteen-pence, and then subsequently return the odd six-pence to him in the shape of reduced rates, that committee becomes popular. Its officials are, as a rule, better paid and generally have pleasanter times than those unfortunate wights who are employed by the so-called spending committees. To the average councillor and ratepayer the balance sheet of the Health or Sanitary Committee is all debit. Disease prevented and health augmented cannot be stated in sufficiently material terms to enable them to rank as legitimate assets.

It has occurred to me more than once, that local authorities in general have really but small interest in promoting sanitary reforms. To a popular watering-place some show of activity is necessary in health matters. Death-rates have to be kept low, infectious cases must not be too numerous, and drain testing has to be freely indulged in, but a large number of local authorities are—and I say it with no feeling of bitterness, but as a serious statement of fact—absolutely apathetic as regards sanitary progress. If this be so, and if, in view of the ever-increasing burden of local taxation, economies have to be effected, it does not require any great power of divination to know which department will be the first to suffer.

Admittedly imperfect as are the Public Health Acts, some steady progress might yet be made were they administered on fairly uniform lines. Naturally one does not expect that absolutely identical methods of administration could be adopted by sanitary authorities throughout the country—local circumstances must be considered. Making every allowance, however, must it not be granted that the present system is simply chaotic. Fairly progressive authorities find all their precautions

spread of disease nullified by neighbouring author-
fuse to do anything. Take the question of smoke
Is there anything approaching to uniformity on
tly simple question? Manufacturers can turn black
the atmosphere at intervals ranging from 2 to 60
hour. In some manufacturing districts there is a
devoted to the work, in other large towns not a
vation is taken from one year's end to another.

n Urban District which has adopted the maximum
cattle in cowsheds, but which it dare not enforce,
that the local dairymen will retire into adjoining
ere no regulations exist, and where, consequently,
supervision can be exercised.

factor tending to foster lethargy is the compara-
nce of the Local Government Board. The central
hich manifests such rigid inflexibility as regards
f the workhouse inmate, which will not permit a
uardians to deviate by as much as a currant in the
of a pudding—this same central authority is
oly apologetic when remonstrating with a local
s to its sanitary shortcomings. An epidemic of
lisease assumes unusual proportions. The Local
t Board instructs one of its Inspectors to visit the
ected and report. The Inspector goes into the
considerable length. The topography, geology, and
y of the district are carefully described; the par-
ses tending to produce or to favour the spread of
lar disease are enumerated, and various recommen-
made to prevent a recurrence thereof. This report
ted to the offending local authority with a request
consider them. The authority meets, passes resolu-
something ought to be done, and then relapses into a
state.

al Government Board has certain powers given to it
olic Health Act, 1875, whereby it can insist on local
carrying out their obligations under the Sanitary
how often does it exercise these powers? A Parlia-
eturn of such instances would be interesting reading.
sion is a thing of beauty, but it has small effect on
it local authorities.

, the attitudes of local authority and central authority
analytically considered, so distinctly discouraging, is
redeeming feature in the steady work performed by
sanitary officers? So far as I can judge—and I do
as a sanitary officer now—but for that work the sani-
of the country would be well-nigh calamitous. In

view of the innumerable difficulties they have had to encounter, the indifference and covert or open hostility they have had to overcome, I marvel at the wonderful improvements that have been made.

But the conditions under which Sanitary Officers have worked, and are working to-day, are most unfair and harassing. Salaries have been and are being paid, which would be derided by the average day labourer.

The iniquitous system of appointments for a limited period, the lack of security of tenure, the possibility that the men who hold the present and the future of the Sanitary Officer in the palms of their hands, may be the greatest of offenders against the canons of public health, the lack of independent power of action, are points upon which no lengthy exordium is necessary.

Nor again can a trained and capable officer view with equanimity some of the more recent additions to the sanitary army. During the past year, a laundry man, a working collier and a butcher, all without previous sanitary training, have received appointments as responsible officers. In the provinces, there is practically no qualification required to secure an Inspectorship, the enquiries instituted by the Local Government Board, when its approval to an appointment is desired, consisting for the most part of queries as to whether the proposed Sanitary Inspector has been a policeman, soldier or sailor, or if he has at any time found it difficult to pay twenty shillings in the pound, and the like absurdly irrelevant topics. The abolition of the monetary qualification for the office of District Councillor, has, moreover, brought into existence a number of individuals who find even the meagre stipend of a Sanitary Inspector to possess strong attractions, and who have, therefore, without much ado, resigned their seats, sought for and obtained public appointments without possessing any qualifications whatever for the office. Several of such appointments have been perpetrated, also during the last twelve months, and their effect is bound to prove baleful.

Such then, gentlemen, are some of the main factors militating against sanitary progress. Taken singly they may appear of comparatively small import, but viewed in their entirety, and regarded as continuously co-operating together, and it will be seen how potent are the forces making for inertia, if not for re-action.

Very few thoughtful people will attempt to defend the existing state of affairs, and differences will only arise as to the best means of remedying them. Some there are who think that if all sanitary appointments were subject to the approval of the Local Government Board; if searching examinations were

if officers were secured fixity of tenure, conditional
haviour and competency; and if a greater degree of
t activity were granted to sanitary officers, all would

ly, I find it impossible to accept this view. Sanitary
ıld still be dependent, in a large measure, for their
nt and for the successful pursuit of their avocations
ɔodwill of the respective local authorities who employ
the fate of those who had to encounter the hundred
:ty annoyances which the smaller-minded Councillors
be able to inflict would be far from enviable.
liatives appear to me to touch only the fringe of the
The disease is deep-seated, and requires heroic

·title of my discourse distinctly implies the remedy I
gest—viz., that the administration of the Public
ts should be taken out of the hands of the local
altogether, and be vested in the State itself. The
tion of land, the nationalization of railways, the
tion of wealth, have each their advocates. Why
re not be a nationalization of health?]
se, I would not insult your intelligence by proposing
lministration should be vested in the Local Govern-
'd as at present constituted. A Ministry of Public
ɪuld be the natural outcome of any nationalization
Time forbids any detailed statement as to the advan-
h would accrue from this change, but the arguments
ainst local control all tell in favour of nationalization.
ıs provisions of the New Public Health Code would
:d, without fear or favour, by qualified men, giving
le time and attention to their duties, and having
n over districts whose areas would not necessarily be
us with those of a local authority; unfettered and
nt, and removed from the sinister influences incident
ɔntrol; with powers to take immediate steps for the
; of deleterious conditions, and working with uniform-
·ecision.
such an administration the realisation of Dr.
ɪn's ideals would be brought within measurable

st the powers possessed and exercised by the Home
and the Factory and Workshop Inspectors with those
and exercised by the Local Government Board and
Officers in general.
ne State has some responsibility in the matter is tacitly
d by the contribution of moieties of salaries of Medical

Officers of Health and Sanitary Inspectors out of the Exchequer funds. But these are considerations which may well be left to future discussion.

Let me, in conclusion, appeal to my fellow sanitary workers to make this question their own. Conferences of Sanitary Inspectors are supposed to consist of the perpetual parade of personal grievances as regards insufficient salaries, insecurity of tenure, and absence of superannuation.

Now these are all good things, and can be advocated on purely public grounds, yet, nevertheless, one has an uncomfortable feeling at times that they savour too much of the personal element. Hence I would suggest that those who are convinced that the Nationalization of Health is desirable should direct all their efforts to this end. Let no fear of being in advance of our times deter us from uttering our inmost convictions on this subject.

In the words of England's greatest thinker: "Not as adventitious, therefore, will the wise man regard the faith which is in him. The highest truth which he sees he will fearlessly utter, knowing that, let what may come of it, he is thus playing his right part in the world; knowing that, if he can effect the change he aims at, well; if not, well also, though not *so* well."

"*Bye-laws*," *by* S. C. G. FAIRCHILD.

(ASSOCIATE.)

ABSTRACT.

LOCKE on Civil Government writes:—"The fundamental law of nature being the preservation of mankind, no human sanction can be good or valid against it."

This is the spirit and object of all the Public Health Acts and Bye-laws made thereunder, in relation to Imperial and Municipal Government. The latter form, or Local Government more directly concerns us in considering a few points of some of the Bye-laws now in force. It would be impossible in one or many papers to deal with the various Bye-laws adopted by different Sanitary Authorities. We may therefore confine ourselves to a few of those more generally in force.

There is a considerable difference of opinion as to how definite and concise a Bye-law should be drawn in regard to the detail of structural works. It has been held that Sanitary Authorities and their Officers should have a certain amount of discretionary power as to the materials used, general detail and conduct of the work.

If a Sanitary, Health, or Building Committee were com-

of thoroughly practical men, with a sound, practical
ical knowledge of Building Contruction and Sanitary
g, men who would insist upon only good and sound
most improved principles, supervised by competent
thin the area of their authority, under these con-
would probably be of some advantage in certain
details to allow limited discretionary powers to the
carrying out constructional works. On the other
mittees are usually composed of men of various
, and although they do their business with the best
it occasionally happens that the result is far from
Under these conditions, I am of opinion that
annot be too concise and clear in details of con-
nd methods of execution, but at the same time
to admit of improved appliances and material being

uld ensure good work being performed with the
xpense and trouble to the Sanitary Authority, and
ent a large amount of mischievous and objectionable
executed.
aring the Bye-laws of a few local authorities, it is
surprising to find that they vary so much when they
r less based on the model Bye-laws, and are finally
or sanctioned by the Local Goverment Board.
paper I propose dealing with :—

v streets and buildings, in relation to air space and
sanitation.
ries, cowsheds, milk-shops, and slaughter-houses.
noval of obnoxious matter.
nmon lodging-houses.
uses let in lodgings.

rds the latter Bye-law, the following points are
notice :—
dlord must keep the premises in a state of cleanliness,
and water-closets in proper working order, and in
s a water-closet must be provided for every twelve
That the air space is defined for each lodger so as to
ercrowding, and that the medical officer and sanitary
have the right of entry at all times.
hstanding these advantages a local authority should
reat care and consideration before deciding to place a
use or a number of houses under this Bye-law, as it
oses upon the landlord to do what is necessary for
the premises in a cleanly and wholesome condition.
is said, however, about the condition of repair. Many

defects may be found on inspecting a number of houses, and yet not one sufficiently bad to be dealt with under the "Housing of the Working Classes Act."

What is the result of living in a registered lodging house upon the occupiers themselves? It is simply degrading them down to a lower social standard of humanity; and besides, if by chance a respectable man and his family are compelled by force of circumstances to live in one of these houses, he afterwards finds it almost, if not quite, impossible to get other apartments or even a house, as the landlords of better class property look upon him and his family as undesirable tenants.

If these houses were occupied only by the helpless and indifferent class no particular harm would follow to the adults, but the children are heavily handicapped in the race for life and position by the odium attached to those living in these dwellings.

In conclusion, it would be of considerable advantage if the Bye-laws were more uniform and definite throughout the country, and that there were Bye-laws made and adopted dealing with the general state of repair and cleansing of dwelling houses, and that it should be an offence to construct, amend, or alter any drain or fitting in connection with water supply, water-closet, or other sanitary appliance, or arrangement, without first giving notice to the officers of the local sanitary authority.

"*Sanitation of Private Schools*," *by* JOHN H. CLARKE.

(MEMBER.)

ABSTRACT.

VERY much has been done of late by legislation and practical efforts to improve the condition of the thousands employed in our factories and workshops; and although there is still room for improvement, we have much to be thankful for. But to my mind the registration of private schools and their closer supervision by the sanitary authorities is as important as that of factories.

The absence of any statistics showing the number, or percentage of children attending private schools and the sanitary condition thereof is much to be regretted in consequence of its immense importance for reasons above referred to, and leave us with only a vague idea of the conditions under which such schools are subjected, and therefore call for immediate legislation.

I have been so impressed with the appalling neglect of the

ules of sanitation in private schools, that I am as-
iat public opinion has not compelled their principals,
ss to teach children in a higher grade, to pay at least
st attention to the drainage and ventilation of such
s.

[am surprised that a royal commission has not been
investigate the work of all schools not under the con-
educational department, seeing that so many thous-
ır children are daily taught in private schools, with
ventilation and drainage; and yet the parents of
ren are led to believe that to send their children to a
hool adds to the dignity and importance of their
ıd prevents them from being exposed to the dangers
ady overcrowded Board Schools; dangers of infection
fer of course to well-to-do artisans and tradesmen.
y of their argument is overwhelming when we must
e exists at small private schools inadequate accommo-
all rooms and consequently insufficient ventilation, to
ıg of the inattention to drainage and insanitary
ıgs.

r to meet the objections I have referred to, and to
tandard of sanitation in private schools I submit that
e of the following points might be worthy of obser-

hat all private schools should be registered by the
l department and sanitary authority of the district.

'hat no house not already under the control and
nt of the School Boards should be used as a day
hout the consent of the educational department and
uthority.

'hat not less than fourteen days' notice of the intention
a dwelling house as a private school should be given
the above named authorities.

'hat the certificate of the medical officer of health of
t in which such house, or private school, is situated,
ttached to all such applications referred to.

'hat forms of application should be provided by the
uthority on which should be stated,

The number of rooms intended to be used for class rooms.

The dimensions of such rooms and cubic space.

The situation of such rooms, means of ventilation, fireplaces, &c.

Sanitary accommodation, drainage and water supply.

That no underground or half-basement rooms should
ed or used as a classroom.

7th. Every classroom to be periodically cleansed under the supervision of the sanitary authorities.

8th. That such registered school be inspected annually by the medical officer of health or sanitary inspector, or as often as may be requisite.

9th. A proper register to be kept of all pupils attending each registered school, and that such register be submitted for the inspection of any officer of the School Board or officer of the local sanitary authority.

Now it may be argued that to adopt stringent rules and regulations would remove the privacy and independence of the institutions, which by reason of the fees charged, constitutes a higher grade school held aloof from public scrutiny; and secondly that many an aged and infirm person, keeping a small kindergarten would be precluded from earning a livelihood in failing to comply with the requirements of the clauses abovementioned. Such an argument is however defeated, when a moments consideration will convince anyone that the health of a dozen or so of pupils is of far more consequence than the opening of a school regardless of its health requirements, or to train a few children under bad sanitary conditions.

That registration would involve additional work upon the already overworked officials might be suggested, but any additional help or expenditure would be a step in the right direction, and meet in every way the tenor of the Public Health Acts.

Upon the question of prohibition of using underground rooms for class rooms, there cannot be two opinions, it is indeed one of the most important points to which our attention should be directed; whatever provisions may be made in regard to proper areas, the very laws of nature and our own common sense view of the unhealthy conditions connected with underground rooms leave no doubt that underground class or work rooms have a disastrous effect upon the health.

Whatever may be the mechanical means employed to ensure proper ventilation, nothing can compensate or supplement the natural forces, or make up for nature's method of disinfection.

Much remains to be done by sanitary authorities in the direction indicated, and the greatest difficulty we have to face is the appalling filthiness of a very large number of the homes it is our duty to visit. Indeed the task seems almost a hopeless one, when no law practically exists in respect to personal cleansing. A house is often visited where the occupier is responsible for its filthy condition, and whatever may be the theory of "moral suasion" the question of cleanliness in every home we see, is a problem yet unsolved. In conjunction with the suggestions of my paper however, we cannot overlook the fact that the sanitary inspector in order to ensure a school of scholars worthy of inspection, must do his best to raise the standard of cleanliness—cleaner rooms and furniture, and clean bedding, and good ventilation.

"*Cisternage and Constant Supply*," *by* H. ALEXANDER, Chief Sanitary Inspector, Shoreditch.

ABSTRACT.

THE AUTHOR, speaking from his long experience of domestic water sewage, asserted that the dangerous conditions attendant upon and inseparable from the cisterns in ordinary use, had long familiarised householders with dirty receptacles, and to such an extent that a deposit of filth in the bottom of a cistern, is accepted by many people as a product of a natural law, to be endured, rather than an effect arising from causes that ought to be removed by an improvement in the form of construction.

These dirty receptacles were condemned in the report presented to the Local Government Board in 1895, on the failure of the East London Water Supply, by Col. Ducat, and the late Dr. Barry, who advocated the provision of properly-designed cisterns, so constructed as to exclude dirt from the atmosphere, and prevent accumulation of deposit from the water itself, and the water to be under pressure of the main—such storage cisterns the Commissioners held to be necessary—"as under the best arrangements there must be times when periods of interruption of a constant supply will occur, and at such times the want of water for domestic purposes leads to injury to health, which the use of a really efficient cistern would guard against."

The two first conditions of the Commissioners model cistern —the exclusion of dirt and the prevention of deposit from the water itself, has been easy of attainment—the third condition that the water in a cistern should be under the pressure of the public main, is also easy of attainment, but owing to the great pressure in some mains, a cistern under such pressure would be a dangerous hydraulic bomb, and to ensure any measure of safety it would need to be made of stout plate, cylindrical in shape, and of small dimensions. These limitations, however, are not necessary, as it has been demonstrated that a cistern of any size, and any shape, from 100 to 1,000 gallons, can be fitted so as to be enclosed, self-cleansing, and without any pressure, and to be practically what the Commissioners desired, viz:—an enlargement of the main.

CONGRESS AT SOUTHAMPTON

(Continued).

CONFERENCE OF LADIES ON DOMESTIC HYGIENE.

THE proceedings of the Conference commenced with an address by the President, Mrs. CONSTANCE PATEY, which was published in the Journal, Part III., Vol. XX.

"*Experience of Health Lecturing under County Council*," *by* CHARLOTTE ALICE SMITH, Lecturer Hants C.C.

ABSTRACT.

LET it be granted that—

(1.) All sanitarians are agreed as to the vast numbers of tuberculous cattle in this country.

(2.) All sanitarians are agreed as to the danger of feeding the young on unboiled milk drawn from cows affected with tuberculous udders.

(3.) All sanitarians recommend the boiling or sterilising milk as a preventive against tuberculosis.

Now let us consider what will happen if such advice be to any large extent adopted—weakness, rickets, marasnus—all wasting disease will naturally result.

Why? Because on boiled or sterilised milk a scum forms, and in this scum a large proportion of the fatty constituents of the milk are entangled. Thus boiled or sterilised milk is practically skim milk, or if not so far deteriorated as to come directly under that category it is most certainly deficient in nourishment and unfitted to serve as human sustenance in early youth.

The truth of this will be apparent to all those who study infantile diseases. Indeed the evils of skim milk dietary on babyhood has been fully appreciated by medical men, and has been made the subject of Dr. Cheadle's Post Graduate lectures. Islington and Camberwell and some other places have issued leaflets of instruction regarding its danger, and in the discussions on the Food and Drugs Bill it actually reached Parliamentary consideration in connection with the evils wrought by condensed skim milk, which is often mistaken for ordinary condensed milk.

And yet sanitarians on all sides bid us boil or sterilize our milk—that is to partially turn it into skim milk!

Now is there any remedy for these evils—must we either imbibe tuberculous milk or by losing the cream laden—scum—produce worse ill than tuberculosis?

Yes! there is a remedy. It consists in so cooling the heated milk as to prevent any scum rising. The scum itself is not cream, it is coagulated caseine in which cream and light particles of the milk are entangled. It can be prevented forming if we carefully exclude cool air from reaching the surface of the milk till the latter is cooled below 100° F. This can be done by heating the milk in a *double* pan with a good lid until the milk is thoroughly sterile, and then lifting the inner pan out of the hot water (with the lid still on) and plunging it half-way in a basin of cold water. Thus the milk will become cold before the air within the pan, and hence no scum will form. This plan is absolutely certain; but any attempt to lift the lid, either during the heating or cooling process, will result in—scum!

Theoretically, ordinary boiled milk should give the same results, but in practice it cannot be carried out as the lid has to be lifted to watch the heating process, and so prevent the milk boiling over. The lifting of the lid (even momentarily) will cause scum to form. But provided care be taken to carry out the above directions as well as possible, even with ordinary boiled milk, better results will be given. For although a scum will form if the lid be raised, yet it will be very light and thin compared to the scum formed under ordinary conditions. A double pan (or a jar with a lid inside a pan) is the only satisfactory method by which to heat the milk prior to cooling it as above directed, if we wish to prevent the cream-laden scum forming at all.

"*Hygienic Aspects of Occupations Suitable for Women*," *by* Mrs. H. Percy Boulnois.

ABSTRACT.

The Author commenced her paper by saying that a woman's occupation should always be suitable to her particular character, ability, and constitution. She proposed to deal with occupations for those women who could make a choice, but in any case a woman should endeavour to take up the occupation for which she is most fitted. Women are by no means new competitors in the field of labour; they have always had certain occupations, only now that the number of working women has increased, it has been found necessary to organise and regulate their work, and therefore the standard has risen.

The Author next gave a list of occupations, and their effects on the mental and physical condition, and pointed out how each one may suit a different temperament. Medicine, contrary to law and divinity, is a profession open to women in England, and requires a somewhat exceptionally gifted woman, as both the mental and bodily strain involved is very heavy. She passed on to speak of the secretary, and how many people undertake this occupation who are utterly unfitted for its duties, and this occasions many cases of breakdown, although the work itself is not unhealthy.

Teaching is a trying profession, but with proper care of health, good ventilation, careful avoidance of worry, and the taking of rest, the work could be made healthy and pleasant.

Teachers of Cookery, Laundry work, Needle-work and Household Sanitation need not fear ill-health, for both brain and body are equally employed. Laundry work only, is trying to those liable to chest complaints. The work of Sanitary and Factory inspectors which is one of the occupations in which women are most wanted, is not prejudicial to health, though it needs a strong woman to undertake it, and one who should be careful about cleanliness, and take plenty of open air exercise.

The occupation of Hospital Nursing is often carried on under hard conditions, but to a strong constitution is not detrimental, cases of ill-health from nursing often arise from the unsuitability of the person for the work. Children's nurses do not have such tiring duties, and child nursing is becoming a regularly-trained profession, and affords a useful occupation for those who are not strong enough for hospital work. Midwives must possess strong constitutions and sufficient nerve to support them through the crises which are continually reached in their work.

The Masseuse must possess health and a good physique, but can renew her vitality during the quiet hours she gets when free from her duties.

Country occupations were then mentioned, such as stock-rearing gardening, poultry farming, bee-keeping, and even ostrich-farming and silk culture, it being pointed out that early rising and watchfulness, which are required, are not in any way prejudicial to health.

After touching on the necessity of good health for the occupations of prison matrons and attendants on lunatics, &c., the Author concluded by mentioning type-writers and shorthand clerks, who often work under great hygienic disadvantages, caused by bad ventilation, difficulty of getting meals, and oral strain. In all occupations attention must be paid to ventilation and the "rudiments of sanitary law," personal cleanliness and proper consideration of nutriment and digestion and the daily functions of the body. If together with these, a suitable occupation is undertaken, there would be no dangers to health in any of these suggested forms of work.

"*The Hygiene of Dress*," *by* VISCOUNTESS HARBERTON.

ABSTRACT.

If the human race originated in warm climates it is likely that the first object of dress was decoration. As mankind spread over the world difference of climate necessitated more useful forms of covering. Ever since, these two systems of utility and decoration have ruled in choice of clothes, and are generally antagonistic.

The two ideas are now exemplified in the dress of men and women, the former being strictly utilitarian, and the latter entirely decorative.

Women's dress, instead of being a help and protection to the wearers, is just the contrary; and owing to its construction (the long, flapping skirt being the most prominent feature), is not only heavy and exhausting for walking, but as it trails into all kinds of filth in the roads, it distributes disease germs in the form of dust over the house, which germs are in due course inhaled by everyone.

In most ways it is injurious to all classes, but most particularly to servants and working women, as if trays or children, &c., have to be carried upstairs, the work has to be done with the body held at a wrong angle, in order to avoid being tripped up by the skirt, and the weight being thus thrown on wrong muscles, is apt to cause internal injury.

Women's dress also errs in constriction. But as the skirt makes the general outline appear widest at the feet, a violent and unnatural constriction in the centre of the body is found to break the clumsy outline that results from ignoring the true form of two legs. This constriction injures and congests the internal organs, but the fact is disregarded, owing to the compression being considered decorative. Corsets ought to be classed with elastic stockings, &c., and only used for figures requiring abnormal support.

Children's Dress.—Parents are not alive to the cruelty of dressing little girls in much too voluminous frocks. And for summer, flapping capes, and large cotton bonnets tied on with strings, are worrying to the children. It is questionable whether white is the best colour either, as it reflects the glare of the sun back under the eyes. Girls are also injured by the boots being commonly made with high, narrow heels, placed too near the instep. Much suffering later in life is probably caused by this. The soles and heels should be exactly like those for boys.

People are aware of the danger of insanitary houses, but seem not to perceive their responsibility in avoiding injurious dress. The reform will have to be consciously taken in hand before long.

The idea that no dress made on a different principle from the present can be beautiful is a delusion. The beauty comes from materials and colours much more than from the shape of the dress; also people are blinded on this point by custom.

The bitterness of the opposition to any real alteration arises greatly from women's position being at present in a transition state. They wish to follow occupations once held sacred to men, yet dread to be thought unfeminine, and therefore try to compromise by adhering closely to the appearance of artificial helplessness produced by the unsuitable dress of byegone generations.

Trying to cling to a dress modelled on lines unsuited to the human figure is, however, not womanly, but merely silly. Women should learn not to be ashamed of their true, God-given form, and adopt a method of dressing which would be a physical help, instead of the impedimental, disease-producing monstrosity of the nineteenth century.

"*The National Evil of Child Labour*," *by* Mrs. HOGG.

IF the battle of Waterloo was won, as the Duke of Wellington said, on the playing fields of Eton, it is no less true that the battle of Industry must be fought and won—or lost—in the class rooms of our elementary schools, and in the general conditions of child-life among our future workers. It is during these plastic years of growth and development that we make or mar the type of social character which it is to the best interest of the nation to maintain; and it is as true to-day as it was when Plato dreamed of an ideal State that its chief interest and duty lie in securing that each member thereof shall have his proper work to do, and that he shall be fitted by his upbringing to do that particular work of his life as well as possible. Once this is clearly recognised, the proper application of it becomes a public duty. We have to begin at the beginning; to influence and mould the temperament of our young citizens at their most susceptible period; to lay the foundation of bodily health and vigour which is to bear the superstructure of capable manhood and womanhood; to furnish them with "that faculty of knowledge and understanding which keeps a man from making a false step, and helps him to good fortune in all his business;" in short, so to order their lives that they may live best, with their highest faculties at their highest degree of perfection and activity. And we have to ask ourselves to what extent the State in its care of its children serves these ends.

A return recently published by the Education Department throws a beam of much-needed light on the social conditions of large masses of children who, both in our large industrial centres, and in remote agricultural districts, are leading lives which cannot be said, even by the most rigid of Manchester School economists, to further the development of human power and capacity.

Part I. of this return deals exclusively with those children outside the protection of the Factory Laws, who, while nominally working full school-time, are employed by their parents or others for profit out of school hours. Part II. with the occupations resorted to by the children who left the elementary schools during the first complete year. Part I. is confessedly incomplete, and the numbers given are far below those of the children actually employed as wage-earners. Some schools return the particulars only of children in receipt of actual money payment, and omit those of the far larger class who work for their own parents in home industries and otherwise for no pay. Others take note only of those whose employment is, in the opinion of the managers, manifestly detrimental to health, or who are in regular work, while many frankly confess their unwillingness or inability to furnish the information required, the matter being, they say, "too private to allow of enquiries on their part." From the various excuses given for these blank or defective returns, it is, however, evident that their omission strengthens rather than weakens the case for legislative protection, since the names included are, in many of the schedules, only those of children who are palpably and regularly overworked.

Such as it is, the return furnishes us with a scheduled list of 144,026 children working regularly for payment of some sort, for hours which range from 3 or 4 to 100 per week, at any trade, and under any conditions, with no legal safeguards that health and education shall not be seriously impaired by such employment. Of these 144,026 children (110,161 boys and 33,865 girls), 131 are under *seven* and 1,120 under *eight* years of age. We find two children of six, the first of whom, a girl, delivers milk for 35 hours, and the second, a boy, for 28 hours weekly. A boy, also of six, makes bricks, nominally for 28 hours a week, though the wage of 3s. 6d., at the usual rate of payment for child labour, argues far more excessive hours of physical toil. Another works on a farm for 24 hours. A nurse of six minds another baby for 29 hours a week for 2d. and food; another for 18¼ hours for 3d. and no food. Others of five sell firewood, mind babies, pick peas, and do cleaning for hours ranging from 6 to 15; while 9 cases are given of employment of children of six in home industries, for irregular hours with no payment.

It is an axiom laid down by one of great authority in matters ethical that, "in all labour there is profit," but it is difficult to see how the most short-sighted policy can find anything but wanton waste and destruction in the labour of these babes at such occupations as carrying coals, sweeping out stables, stone-breaking, brick-making, newspaper and other street selling, matchbox-making and so forth.

Among the countless hard cases which call for notice in the higher standards, are those of two lads of ten and twelve working on farms, the first for twelve hours daily, the second from 6.30 a.m. to 9 p.m., a total of 87 hours a week. A butcher's boy begins work at 5 a.m., returning to it after school till 10 p.m. On Saturdays his hours are from 8 a.m. to 10 or 11 p.m. A boy employed as billiard marker, among distinctly injurious moral and physical surroundings, is at his post every night till midnight. Another is up every morning between 3 and 4 a.m. to call workmen, by each of whom he is paid 3d. a week for his services. When this preparation for the day's work is over, he delivers papers from 5.30 till 9 o'clock, when his education is supposed to begin. In my own enquiries into this out-of-school work, I came across the case of a little girl of seven who was also out every morning at 4.30 to call the workmen in the adjoining streets; and a large number of children described as knockers-up in the return, as well as milk-boys, farm-labourers, and market-boys, begin the day's work at 2 and 3 a.m. Think of what it means for these unfortunate children to be out two or three full hours before sunrise, insufficiently clad and breakfastless on a cold wet winter's morning, and of what their capacity for school must be when 9 o'clock comes. One child actually works in a dust yard from 6 p.m. to 9 a.m. for four nights a week; and many shop boys and barber's boys are kept up till midnight and later on Saturdays.

The hours of seven fisher-lads in Cornwall, whose ages vary from nine to thirteen, are returned as "about 80." Those of thirty-two farm-lads range from 70 to 90; of five shop-boys—one working 14 hours daily—from 72 to 84; of eight errand-boys from 72 to 84; while one newspaper-boy works 100 hours weekly, plus the time nominally devoted to the acquisition of useful knowledge.

When we come to the tables dealing with the girls, they are far more indefinite, and the work apparently more casual and irregular. 11,585 are returned as minding babies, often as big as themselves, and 9,254 are doing cleaning, laundry-work, etc. But it is evident from the remarks of managers and teachers that the far larger number, not included in the tables, because working in various forms of the slavery summed up in the words "home industries" for their own parents and for no pay, would, if correctly tabulated, present a no less iniquitous record of overstrain than that of the boys. It is unfortunately true that home-work almost invariably means child-labour—chiefly girl-labour—at all hours of the day, and often far on into the night; and it is in this fact and in the temptation it offers to parents for making slaves of their children, that we find its strongest condemnation. I could, from personal experience of the sweated trades, bring forward case after case of little match-box makers working habitually from the time school closes till 11, or even midnight: of little artificial flower-makers beginning to twist green paper round the wire stems of flowers at 5 a.m., and toiling through the long weary day in a small filthy attic, where the air is further polluted with gas for the irons, with the smell of dyes and gutta-percha, and with the poisonous dust of the pigments. From various schools come remarks such as: "Thirteen girls out of thirty-two earn money at shirt and button-hole making"; "during the hat-sewing season, many girls of all ages are employed, both before and after school hours, in sewing hats for their mothers. Some have been known to work from 6 a.m. to school-time, and again from school-closing to bed-time"; "in addition to these, very many are employed by their parents in the cabinet-making and boot-trades without remuneration"; "at least a hundred are employed during two or three half-days' a week fetching work for parents, and returning it to shops"; which usually means carrying bundles far in excess of their childish strength. When we come to cases of which particulars *are* given, we find two girls employed daily, one at 3d. a week in cleaning and errands from 7.45 to 10 a.m., 12.30 to 1 30 p.m., and 4.30 to 8; the other at 9d. a week and her food, in carrying parcels for a milliner from 7.30 to 9.30 a.m., 12.30 to 2 p.m., and from 4.30 to 8 p.m. A girl of 12 does general house-work for 41 hours a week, also for 9d. and food; and another for 58 hours for 2s. 3d. and a meat pie. The hours of three entered as minding babies are returned as from 70 to 77; and those of a maid-servant and of a shop girl as 78. Owing to their frailer physique and more rapid development the girls suffer more in health, and break down more rapidly than the boys under the double strain involved in this dove-tailing of wage-earning with education; and from all quarters come reports of how they are "too heavily taxed for their strength, and have no real childhood." Moreover, they are more often kept from school altogether when there is a job going, or they work hard during the morning, and go to school in the afternoon, tired out, and totally unfit to learn.

As one reads through the pages of this document, rightly described by Sir John Gorst as a "painful and sickening document," and realises the unending drudgery of these thousands of young lives made bitter with hard bondage, one can but marvel how a state of things, as disgraceful to our humanity as it is perilous to our prosperity, should for so long have been tolerated by those who have the true welfare of the nation at heart. "How," to quote the words of one whose whole life was devoted to the amelioration of the lot of our child toilers, "how can you expect to get manly men and womanly women out of creatures from whom such toil is exacted. Surely labour, brow sweat, hard earnings come soon enough, without having God's great gift of life crushed, defaced, and contorted, in the spring-time of youth. It is tampering with the very seed corn from which we expect one day to reap the great harvest of a noble, national life." And yet, here to-day, in the heart of the mightiest empire the world has ever known, there are countless hosts of children who are not only deprived of every glimpse of the healthy natural joys of childhood, stunted in growth, exhausted in brain and nerve power, but for whom the key to the golden treasure-house of knowledge is for ever out of reach. And the nation thinks it finds compensation for this waste of working powers in the average wages earned of about 1s. a week. Putting it on the lowest grounds, it is bad national economy to save 1s. to-day that would have re-appeared as £1 to-morrow. It is spoiling the ship for the sake of the ha'porth of tar. The nation needs the best thought and capacity of its citizens. It cannot pay in the long run to pursue a policy of non-interference with parents who, under the specious name of liberty, are allowed to bar the gates of the only liberty worthy of the name against the child —liberty to grow in grace, in the dignity of true manhood and true womanhood, and in the knowledge of and love for whatsoever things are lovely, pure, and of good report.

It remains then to find a remedy, if our blind instinct of pity is to become an active power for helping these oppressed children to make the best of the strength and intelligence with which Nature has endowed them. And here I have three practical suggestions to put before you.

(1.) With regard to children employed in home industries, I suggest that Clause 98 of the Factory Act of 1878, which exempts from the operation of the law those domestic workshops where work is done irregularly and casually, should be deleted, for the purpose of bringing the children within the provision of the Act as it applies to ordinary domestic workshops; that these provisions should, for the instruction of parents and other employers of children, be posted in all domestic workshops, and that the clauses relating to hours of labour for children should be amended by the prohibition of work between the hours of 7 p.m. and 7 a.m.

(2.) For the protection of children engaged in the delivery of goods, soliciting orders, calling workmen, or in any other manner employed in the streets, I suggest that an Act be passed, similar to the clause in the Act for the Prevention of Cruelty to Children (1894), by which local authorities shall be empowered to make bye-laws prohibiting all such employment for children of school-age within certain specified hours.

(3.) As an additional safe-guard for these two classes of children, and for the protection of others not classified under these heads, I suggest that, wherever the education of a child is obviously impaired by the labour imposed upon him or her out of school-hours, it shall be a legal as it is already a moral offence in the parent; and that School-Boards shall, after due notification, and if such employment be not discontinued, have power to prosecute before a magistrate.

It has been well-said that there are many laws conceivable that would greatly better and strengthen the national temper, but that for the most part, they are such as the national temper must be greatly bettered before it will bear. And it is in this bettering of the national temper, in the creation of the greatest power under heaven, the power of public opinion against such conditions as these of which I have been speaking, that we have, one and all, our duty to perform.

"*The work of a Health Visitor*," *by* Miss ROSETTA E. GARDINER, Health Visitor, Birmingham.

(ASSOCIATE.)

ABSTRACT.

WOMEN Health Visitors have recently been appointed by the Birmingham City Council to go into the worst parts of the city, and by friendly intercourse, exercise of womanly sympathy and tact, urge the poorer classes to a better and healthier appreciation of the rudiments of hygiene.

The Health Visitor must, of necessity, be a woman, and the work is such as will appeal to the sympathies and affections of women, who, from love of their fellow creatures, and from knowledge of the miseries and sufferings endured through ignorance of the merest elements of health and decency, seek by advice, example and practical sympathy, to urge them to the living of bright, happy and healthy lives. The duties of Health Visitors vary slightly in different towns. In Birmingham the Health Committee's instructions are:—

To visit from house to house in such localities as the Medical Officer of Health shall direct.

To carry disinfectant.

To direct attention to the evils of bad smells, want of fresh air, and dirty conditions of all kinds.

To give hints to mothers on feeding and clothing of children, and induce them to send their children regularly to school.

In cases of sickness to assist in promoting the comfort of the invalid by advice and personal help.

To urge on all possible occasions the importance of cleanliness, thrift, and temperance.

They must note:—

1. The general sanitary condition of the house—(*a*) the number of rooms and their occupants; (*b*) the existence of bad smells whether they arise from deficient ventilation, bad drainage, or accumulation of filth; (*c*) the state of the walls and floors whether dirty from tenant's or landlord's neglect or in need of repair.
2. The general mode of living.
3. The feeding and clothing of infants.
4. Any cases of illness—(*a*) the nature of disease, if contagious, enquire when and how contracted; (*b*) whether medical man is in attendance; (*c*) how far the necessary sanitary precautions are being carried out.

The routine day's work consists of meeting at the Health Office to write report of the work done on the day before; to receive instructions in regard to difficulties met with; to revisit any cases of sickness or neglect which may need frequent attention, such as "Wasting Disease," Diarrhœa, Measles, Morbid Conditions of the body, etc.

To visit systematically in the appointed district.

To render first aid in any accident.

One of the most important of the Health Visitor's duties is that of instructing mothers in the feeding and care of their infants, and it is in this direction we hope to see statistics prove the value of our work by an appreciable reduction in the infant mortality.

In Birmingham the work has only been in progress a few months, and as each Visitor has from 5,000 to 6,000 houses in her district, it is impossible to state, at present, whether the good results obtained have been continued in each instance, but generally speaking results are most satisfactory, and a greater regard is being shown for the simple laws of health.

The work of a Health Visitor must not be confused with that of a lady Sanitary Inspector, who deals principally with the employers of labour and the conditions under which the poor earn their living, whereas the Health Visitor deals primarily with the conditions under which the poor live. Naturally a large number of sanitary defects are met with by the health visitor; these, however, are reported to the inspector of nuisances.

Instances from the Daily Reports of the Health Visitors were given indicating the necessity and importance of the appointment of such officers as an addition to the Health Administration of our large towns.

The author's object is to show that the work of health visiting is essentially a woman's work, and that it is of vital importance in maintaining the health of our great cities, accomplished as it is by personal contact with those whose ignorance of cleanliness and hard conditions of life would make it impossible to obtain that enlightenment in the laws of health and decency which the conditions of life in our great cities demand.

Health Visitors must be tenderhearted, well educated women, with an abundance of patience, tact, commonsense and sympathy for the work in which they are engaged.

"*Infant Mortality*," *by* Miss ISABEL G. SMITH.

ABSTRACT.

THE object of this paper being to discuss the subject, not from the point of view of the Registrar-General, but from that of the actual visitor in the homes of the poor, it deals less with statistics than with those factors—the result more of ignorance than even of poverty—which the Health Missionary, whether official or purely philanthropic, can do very much to reduce.

Taking the figures for the thirty-three great towns for 1898, a comparison of the general death-rate (19 per thousand) and that for infants under the age of one year (178 per thousand) at once shows the gravity of the subject; and, it being the conviction of the writer that the majority of these deaths are, firstly, preventible; secondly, due to a disregard among the working-classes of such matters as cleanliness (including purity of atmosphere), regularity in treatment of infants, proper clothing and right feeding, she feels justified in dwelling on these commonplace details, the more so as it is a cause which every woman visiting among the poor can combat.

This opinion is confirmed by Dr. Hill, Medical Officer of Health for Birmingham, who in a valuable report on this subject shows that in that city, where the difference between the death-rate of the rich and that of the poor districts is particularly great, it is not in those wards which have most back-to-back houses, or in which other structural defects are most common, that the infantile death-rate is highest; in short, that those conditions which most unfavourably affect adult life are not those which we must *first* consider in our efforts to preserve the lives of infants. As remedies for the neglect arising from ignorance, which Dr. Hill recognises as the root of the excessive infant mortality, he suggests the teaching of the management of young children, both in health and sickness, to girls in elementary schools; free lectures to women on the same subject; and the visitation of the homes of the poor by ladies who would give simple advice and instruction upon the feeding and nursing of infants.

The need for such supervision has already been practically acknowledged by the Vestry of St. George-the-Martyr, in the appointment of two women inspectors of tenement dwellings, and by Manchester with its staff of health visitors,—examples which have already been followed by several other districts and towns, among the latter being Birmingham.

But whatever official appointments may in future be made, there will still be an enormous field for the voluntary worker, who with her larger leisure can do so much to save the inspector's time for the actual requirements of the law, by instilling the elementary principles of cleanliness, ventilation and hygiene generally into the minds of the persons visited, and by seeing that her instructions are carried out. Their common object being to help, if ever so humbly, to raise the tone of humanity, it is surely not too much to hope that these two, the philanthropic visitor and the officially appointed inspector, may regard each other in the light of coadjutors, each aiding the other towards the desired end.

As regards *Cleanliness*, it is in their failure to appreciate the benefits of fresh air and air-space that our working-men's wives err most. The visitor will do well to urge that the largest room should be in daily use, preferably as bed-room, and not, as is generally the case, kept sacred to Sunday afternoon. The necessity for ventilation must be enforced, and the people shown how, when the window cannot actually be kept open at night, fresh air may yet be admitted without draught.

Paradoxical as the statement may seem, the poor are much given to overcrowding their houses with furniture. This habit is to be deprecated, especially in the bed-rooms, which should be as scantily furnished as possible, and should not, above all things, have all the family clothing hanging or lying about. One very necessary provision, however, is a separate bed for the baby. The seriousness of the subject of suffocation is evident when we examine the figures. In 1895, of 2,319 deaths from this cause in England and Wales, no less than 2,034 were of infants under one year, and 1,340 of infants under the age of three months. On the authority of the Coroner for the largest district in London, *drunkenness* is not, as is commonly asserted, the general cause of this fatality. He usually finds, on the contrary, that the mother has slept heavily simply from being over-tired. It is but seldom, too, that an infant is actually *overlaid*. The process is a much simpler one, and no woman, however temperate, should run the risk by keeping her infant in bed with her.

The second point to be emphasized in the management of infants is strict *Regularity* in all the little details of their lives; but especially in *feeding*, a matter in which the greatest laxity prevails.

On the question of *Clothing*, our advice to the mothers may be summed up in the rule: "Infants' clothing should be soft and warm, but not tight; and should entirely cover the lower part of the neck, the arms and the legs." The latter part of this injunction is that which we find most obstinately infringed, the result being seen in the enormous death-returns from diseases of the respiratory organs.

The vast majority of the deaths of the young children of the ignorant occur from *Improper Feeding.* Summer Diarrhœa, which annually carries off thousands of victims, most commonly attacks those who have had unsuitable food, irregularly given in unclean bottles. The pernicious habit of allowing an infant to lie sucking its bottle for an indefinite period is a cause of unspeakable mischief, both from the baby thus feeding in an unnatural and dangerous position and from the stomach not being allowed due rest. The food should therefore be the visitor's first care, especially when the infant is hand-fed; but even the mother who rears her baby in the natural way requires watching; for, from a mistaken idea of thereby hastening its growth, she is frequently found to be also giving food-stuffs which are injurious to young infants.

"*The Ladies' Health Society of Manchester and Salford, in union with The Manchester and Salford Sanitary Association,*" *by* Mrs. REDFORD.

ABSTRACT.

SOME 39 to 40 years ago, a few ladies, becoming conscious of, and deeply impressed by, the appalling ignorance of the most elementary ideas of hygiene displayed by many of the people living in the poorest parts of the city, resolved to do what they could to teach people simple every-day facts concerning personal and household cleanliness, and the necessity for each doing what they could in their own homes to ensure healthy surroundings for themselves and neighbours.

This most useful idea has been gradually enlarged upon and developed until the present time, when the society has in its service 23 women workers, named Health Visitors, 16 of whom work in Manchester and 7 in Salford.

At the present time the means employed for carrying out the objects of the society are—personal visitation of districts represented as requiring special attention, and the formation in those districts of mothers' meetings, where opportunity is given for health and sanitary addresses, in plain words; and where the teaching can be followed up and impressed on the women by the ladies, who know them personally; and habits of thrift, cleanliness, &c., can be encouraged and fostered.

For example, in connection with each meeting, there are numerous clubs; thrift and savings clubs for a variety of purposes, and coal and blanket clubs especially. Many women have said the blankets, &c., have seemed to come to them as a gift. The small weekly payments have been scarcely missed.

The workers of the society consist of the lady superintendents of the various districts, whose work is entirely honorary; the lady lecturers, whose work is also entirely honorary, and the health visitors, who receive payment for their services.

To this combination of effort very much of the success which has attended the work of the society is undoubtedly due.

The lady superintendent, from her larger knowledge, can direct the health visitor's work, help and encourage her in many ways, and assist in training her for her special duties. The superintendent also conducts the mothers' meetings.

The health visitor is usually a superior woman of the class sought to be helped. She is in touch and sympathy with the people she visits; she understands them and they understand her. Each visitor lives in her own district, in a small cottage, or maybe a couple of rooms. She is easy of access at all times, and her home is naturally an object lesson in cleanliness, tidiness, &c., to the neighbours, who of course occupy exactly similar houses. She is regarded as a friend, and proves herself a true one over and over again. The amount of work the health visitors do never can be correctly tabulated; I mean work over and above what is required from them by the rules of the society. Having the good of the cause in which they are engaged very much at heart, they freely give of their own time and best energies to the furtherance of it.

The health visitors make no pretensions to be considered nurses, and never enter into rivalry with the district nurses, but as, during the course of their daily visits, they find cases where a little help is most valuable—it may even be to the saving of a life—they are instructed in simple nursing. They carry linseed meal, ointment, and a few bandages with them in their bags, and are therefore ready at any time to make and apply a poultice if required. They will also wash and dress a baby, make a bed for a sick person, and tidy up a room, cleanse the heads of elder children, instruct mothers how to feed a baby, and show an idle, shiftless woman how to make her house clean and habitable.

The authorities of Manchester and Salford supply the society, free of any charge, with as much carbolic powder as is required. They also supply brushes and lime for whitewashing purposes. The visitors lend the brushes, give the lime, and instructions how to use the brushes.

To give some idea of the work that can be described in figures, I quote the following from last year's report:—

During the [illegible] months ended November, [illegible]:
[illegible] visits were made in Manchester, 1853 being specially for the Medical Officer of Health, the remaining [illegible] being ordinary house to house visits.

In Salford, during the same period:—
[illegible] visits were made.

While visiting, the health visitors distribute and explain the meaning of numerous leaflets for the medical officers of health, on such subjects as:—

(1) Precautions against summer diarrhoea.
(2) The prevention of consumption.
(3) Precautions against measles.
(4) Precautions against whooping cough.
(5) Suggestions to householders.
(6) How infants should be fed.

And, from time to time, the health visitors make special reports on subjects which the medical officers of health may wish to obtain information upon.

The work is essentially a woman's work, and the members of the Ladies' Health Society, recognizing and deploring the conditions under which the poor have to live in such crowded centres as Manchester and Salford, are striving to do what they can, with the means at their disposal, to make the lives of the people, among whom they labour, healthier, and, therefore, brighter and happier.

"*Injurious Effects of Over-education*," *by* Miss EDITH ESCOMBE.

ABSTRACT.

THE author called attention to the difference between the wise theories of true education, as endorsed by the educationists of the day, and the unwise practice of misconceived education, as now carried on in our preliminary schools; the true theories were the result of careful consideration of what right education could do for our country, the practice showed that where failure had ensued it was because those theories had been misapplied by others of less cultivated minds.

In support of her view that the educational theorists were sound, she quoted from the Code, and added: The theory is admirable, everything that could be desired. A well-proportioned measure of physical, mental, and moral training; well-designed buildings; rooms allowing of so many cubic feet of air to each child. Sufficiently spacious playgrounds to allow of children moving without touching each other. A judicious arrangement of work to suit the capacities of the average child; special arrangements for defective children, classes adapted to the requirements of each child at the different stages of its development. A teacher who fully understands the child-nature and human nature, and is prepared to use all reasonable care in the ordinary management of the school; to bring up the children in habits of good manners and language, of cheerful obedience to duty, of consideration and respect for others, and of honour and truthfulness in word and act.

But to leave theory and come to practice, what is the actual state of affairs, as far as the child is concerned?

Dr. More Madden, physician to St. Joseph's Hospital, Dublin, said, "from his twenty years' experience of children's disease, of late years there was an increase of nervous disease in childhood, and this he attributed to school over-pressure." With this Sir Charles Cameron agreed.

The author went on to draw attention to the folly of the rough classification of children in preliminary schools, some of whom belong to three generations of respectable lower middle class citizens, while others were of the very poor. Upon this point the writer quoted Dr. C. Browne's Report to the Education Department upon the alleged over-pressure.

"It would, perhaps, be correct to say of London Elementary Schools generally that they contain from 20 to 30 per cent. of bright, clever children, who can easily accomplish all the work required of them by the Code each year in seven or eight months; of from 40 to 60 per cent. of children of average intelligence, who can do it comfortably by steady work in the twelve months allowed; and of 20 or 30 per cent. of backward children who cannot fairly do it in that time, and must, therefore, be pressed in order to get as many as possible of them to make a passable appearance. The clever children must be kept back, much to their mental and moral detriment, and the backward children must be stimulated to a rank, spongy-brain growth, and to a straining effort that wrenches the whole system and may permanently damage health in order that the great modern Giant Examination may have a huge meal. . . . . It is not so much the intellectual effort demanded in elementary schools as the worry and anxiety mixed up with it that do the mischief and induce ailments; . . . . over-pressure in all its intensity, intellectual and emotional, which operates chiefly on backward children, who may be roughly classified into three groups—the dull, the starved, and the delicate. The headaches of children are, I believe, essentially nervous—even more so than those of grown people. Now, we have evidence that the headaches of elementary school children in both sexes and in every standard fall in large preponderance in the latter half of the day, when the brain gets exhausted and the pressure of work tells most seriously upon it. They are, therefore, fatigue headaches. Prevalence of sleeplessness among elementary school children in London:

Boys.	Per cent.	Girls.	Per cent.
2,257	41·4	2,043	35·9

Leader, *British Medical Journal*, July 27th, 1889.—"Much anxiety has been expressed in many quarters, both in this and other countries, as to the effects of educational pressure upon the brain stability of children. The report shows that about one child in twenty for the public elementary schools presented some indication of nervousness, nerve weakness, or defect, and as we follow the distribution of such conditions the proportion rises to 1 in 10 for the highest class school, or 1 in 7·5 immediately after the Government examination, falling in industrial pauper schools to a low figure, probably in part owing to the fact that the school arrangements were, in some degree, under the supervision of a resident medical officer."

The reasonable care judged by the Code to be an essential of true education the writer shows has to give place to the exigencies of methods, and she goes on to say: "Everyone who has taught knows the weariness that comes upon children with the prolonged strain of merely paying attention, apart from actual brain work. Teachers see, and know the meaning of the dull vacant look that comes over children's faces, but they cannot on this account stop work. The theory of an equal education for all is a false ideal. The education that trains children to fill, as men and women, those positions in life for which circumstances have destined them is a wise and far-seeing education, that includes alike physical, mental, and moral progress. A State education that by technical and manual education prepared its children for emigration in the country's colonies would be doing a saner and worthier work than the education that overworks the brains of its children, unfitting them for the only life that is within their reach. Seven thousand boys and girls in the district of London alone go out in life without a really fair chance. Their physique is weakened, their intelligence dwarfed, their originality and adaptability almost wholly destroyed by the terrible routine system adopted in our gigantic pauper schools.

Neither greatness or genius are the outcome of education. "Humanity has progressed solely by self-instruction," and it were well to realise with Sir William Hamilton that "all true education is *growth*, and what we grow to be concerns us more than what we live to know."

Teachers must be trainers, not crammers. The child grows by virtue of its inherent vitality, and, were he rightly trained, would, as he grows older, trend naturally towards a line of life suited to his individual capacity; whereas, too often, the energies of children and students are directed to ends utterly unsuited to their individual capacities. The child rather than the work should be the consideration of all education. Not until this fundamental principle of education is rightly understood can it be said with truth, "It is well with the child."

"*Practical Teaching of Hygiene in Schools*," *by* Miss B. HALL.

ABSTRACT.

1. *Necessity.*—The absolute *necessity* of the inculcation of the laws of health among the working classes through the medium of the children attending elementary schools is now so fully recognised, that it will be necessary to say but little under this head.

The necessity chiefly arises from the absolute violation of the sanitary laws, especially as to cleanliness of the *person* and *home* among the class referred to.

Most of such violation arises from *ignorance* of the subject, but a great deal also is due to the want of cleanly personal habits, handed down from insanitary *houses*, insanitary cities. Those who are to be the future teachers of hygiene require both a knowledge of sanitary laws and how to apply sanitary principles practically, and must also sufficiently understand child nature to be able—in teaching hygiene—to awaken thought and stimulate enquiry as to the hygienic environment in which the child is being educated.

"*The Necessity for a Universal Teaching and Practice of Hygiene*," by Miss BLANCHE GARDINER, B.A. (Lond.)

(ASSOCIATE.)

ABSTRACT.

IN order for the nation to become strong, healthy, active, labour-loving, instead of weakly, neurotic, anæmic, influenza-stricken, a knowledge of Hygiene, and of living and acting hygienically, must be *universal;* must be the guiding principle permeating every class of society; must not be confined to particular sections, but must be practised by *all*, both elementary and secondary schools, boys and girls, men and women, poor and rich, the labouring classes and the leisured ones, old people as well as young.

While the wish to inspire the *children* with sanitary knowledge is a most praiseworthy one, yet the claims for instruction on the part of the *elder* members of the community are apt to be neglected, on the grounds that these latter are less receptive, and too old to learn.

As a result, the parents, ignorant of Hygiene and sanitary matters, cannot be in touch, in this respect, with their children, who, coming home from their Hygiene lessons at school, excited, and eager to put into practice what they have lately been taught, very quickly have their ardour and enthusiasm damped, instead of encouraged and sustained.

It is only when Sanitary knowledge has become *universally* diffused, and when it has been popularised by means of every single existing organization (educationary and religious) that

the preventable diseases, small-pox and consumption, infantile diarrhœa and drunkenness, shall be not only "preventible" but "prevented."

At present, instead of *all* being well versed in sanitary matters, there are merely scattered here and there throughout the community, a *few* expert specialists, a *few* doctors, and nurses, and medical officers, and sanitary inspectors, and health lecturers; *few*, that is in comparison with the great number of untutored.

Upon these comparatively few more-skilled ones, there rests, therefore, a heavy responsibility, namely, that of scattering as widely as possible that valuable knowledge they are fortunate enough to possess.

Two ways suggest themselves for this wholesale dissemination:—

1. By all doctors, nurses, medical officers, sanitary inspectors explaining fully (though simply and with tact) to the people with whom they come into personal contact, the reason why certain conditions *are* insanitary, how it is they endanger health.

2. By their exerting a wide influence for good over their less skilled fellow beings by setting them the example, and always "living" and "acting" hygiene, and leading purely hygienic lives.

While "example is better than precept," yet example plus precept is best of all. Nothing weakens the cause of sanitation so much, as when sanitarians' actions are at variance with their teachings, and the uninitiated realise that they must always do "what the doctor (inspector, health lecturer, etc.) says, not what the doctor (etc.) does."

Finally, as to the method of teaching hygiene, everyone realises now that to be taught properly, it must be taught *practically*—that hygiene *books* should be abandoned—and that the hygiene student who makes a practice of having the bedroom window always open, of putting the bed "to air," of pouring the tea off the leaves, of burning the potato parings etc., may be far better equipped, from a health point of view, than another who has passed South Kensington examinations, and yet does not think of putting into practice the many things she can quote off by heart, or write down upon paper.

"*Some Objections to Physical Education for Girls and the Answer to them,*" *by* Miss MABEL PROCTOR.

ABSTRACT.

DURING the period that I have been engaged in teaching physical exercises, various objections to their use have been offered to me. Some of these I propose to try and answer.

Objections:—One of the most frequent objections raised is that physical exercises require a large amount of apparatus.

This objection is based on a misunderstanding of physical exercises. A little apparatus is no doubt an advantage, but it is not absolutely essential.

LING, one of our highest authorities on the subject, states that given sufficient floor space, nothing more is necessary than the human body.

Results may however be obtained more quickly, and more variety be given, by the use of apparatus, but it may be simple and inexpensive; for instance, a Swedish double boom can be made at the small cost of £2 or so by a local carpenter; of course where wood is cheaper even this price would be a high estimate.

In a school very often apparatus can be improvised out of desks and forms, and the pupils may help each other, when they are old enough to be steady, and to understand the value of what they are doing.

A very important objection made to physical exercise for girls is the fear of strains or twists.

If we consider how strains are caused we shall see that this objection is not well founded.

The straining or stretching of a muscle beyond its ordinary limits of expansion may easily occur, if a pupil is attempting an exercise which requires a higher degree of co-ordination of muscle power than she has yet attained to. If the exercises are properly graduated this should never happen. Each exercise will pave the way for one a little more difficult, and the progression will be so gradual that the pupil will be able to do complicated movements that would have been impossible for her to do before without undue effort.

The necessity for suitable clothing has been made an objection.

It is of no use girls trying to do gymnastic work in ordinary clothing: it is not only useless, but harmful. In bending backwards, to the side, or in suspending, the body would naturally expand; and if the clothing fits the body when in repose, it must prevent this natural expansion. It is a very interesting experiment to stand with the back to the wall, touching it from head to heels, and in that position to try and fasten the ordinary clothing. Many people will find that all their lives they have been wearing their clothes too tight, and have never had a proper chance of expanding their lungs and breathing freely. Even if the clothes are not too tight, as they are usually made, it is impossible to take active exercise without spoiling the garment. Thus showing how they hinder free movement.

Often the effect of physical exercise is to make a girl quieter and less boisterous at home when the exercises are over, they having acted as a safety valve to the superfluous energy.

Another objection frequently made is that the exercises stretch the pupils and make them too tall, and that, when growing, it makes them grow taller than they would otherwise do.

The exercises may make them appear taller, because they hold themselves more erect. This is especially noticeable if they have been round-shouldered before, which they are very apt to be when growing quickly.

"*The value of Crêches or Nurseries for Infants and Young Children,*" *by* Miss C. J. Wood.

ABSTRACT.

The paper starts with the assertion that Crêches or Nurseries are necessary evils. It is argued that to remove the infant from maternal care is to act contrary to the laws of nature; that to congregate infants together has been found to impair their vitality, and to increase infant mortality. There is an absence of statistics on this point, but forasmuch as it is known that some well-managed homes for deserted and other infants have had to be closed on this account it seems proved that the violation of hygienic laws acts adversely on infant life.

From the economic side there is little to be said in favour of a system which makes it easy for the mother to leave her young children with strangers and take her place among the wage-earners. Except in special circumstances the mother's

place is at home, and it is more than likely that the extra money thus earned will be dissipated in the increased cost of clothing, maintenance, etc. For the mother to work away from home violates the sound principle that the father is to support his family and the wife is to look after the home.

From the physical point of view, inasmuch as the bringing up of young children apart from the mother is against the laws of nature, good results cannot be expected from the artificial rearing in the crêche. There also lurks the danger of infection or of contracting diseases born of dirt. Where the crêche has the advantage over the home, is in the regularity and suitable nature of the feeding, and in the medical supervision, but this is more than counterbalanced by the artificial method of feeding.

From the social point of view there is little said in favour of the crêche; it facilitates the breaking up of the home life, it withdraws the most important person, the infant, from the home-circle, weakens the tie between parent and child. It makes it possible for the mother to betake herself to the factory or other employment, and the neglect of the home is almost certain to act unfavourably on the elder children, to destroy the home comfort, prevent the following out of home education, and induce independent habits which are subversive of all true family life.

In favour of the crêche it is said that there are mothers who must seek its aid, the widow, the wife of the stricken husband, and the like, and that given these circumstances the crêche does the best possible for the infant, and from that philanthropic standpoint its necessity is demonstrated. This appears to be its only value in our social life.

"*The Need of Teachers Holding Certificates in Hygiene,*" *by* Miss ALICE WADMORE.

(ASSOCIATE.)

Attention has been called lately to the importance of the science of Hygiene forming part of the educational list in all girls' schools and women's colleges, but the value of teachers themselves holding certificates for Hygiene has hardly been sufficiently considered. Not that a certificate for any subject is the all-important point, but it is the outward and visible sign and stamp of the standard of knowledge a teacher possesses of an especial kind.

Teachers are surely more valuable in their educational efforts if they know something of the simple laws of health, as they can then endeavour, standing on firm ground, to give forth and improve the ideas and raise the physical condition of their classes.

A practical trained knowledge of every-day matters is necessary for all teachers—both for themselves and for others—to ensure "complete living." To obtain this the teaching of Hygiene to teachers should be both in theory and practice.

A thorough trained knowledge of Hygiene, in the largest sense of the word, should form part of the training career of all teachers, both men and women. Each training college ought to make this subject actually compulsory on all its students.

Possibly in a few years a teacher will not be admitted as a worker in a school unless he or she hold a recognised certificate for Hygiene, while perhaps no teachers will be able to hold a headship unless they obtain a superior certificate for hygiene for three months' training from a centre recognised by the Educational Department itself.

One of the most important movements in this direction is the scheme organised by the Yorkshire Ladies' Council of Education for the training of sanitary inspectors, health lecturers, and—it is to be earnestly hoped—also school teachers.

CONGRESS AT SOUTHAMPTON
(Continued).

CONFERENCE OF PORT SANITARY AUTHORITIES.

THE proceedings of the Conference commenced with an address by the President, MILLAR WILKINSON, C.C., Chairman of Port of London Sanitary Authority, which was published in the Journal, Part III., Vol. XX.

"*Vaccination Stations and Seaports*," *by* E. W. HOPE, D.Sc., M.D., M.O.H. Liverpool.

(FELLOW.)

MEMORANDUM.

THE Sanitary Authorities of the cities and towns which happen to be seaports have two series of obligations as regards sanitation.

The first includes all the responsibilities imposed by law in regard to the sanitation of the city itself, and these they share in common with every other town. But, in addition to these, there is super-added the duty of protecting the town, and indirectly the whole country, from the risks and dangers resulting from the introduction of infectious diseases from foreign ports, a protection which must be accorded in such a way that interference with commerce and commercial interests shall be altogether obviated, or at least reduced to a minimum.

The country having the greatest marine commerce, and consequently the greatest interests at stake, should have a sanitary administration which meets as nearly as possible these requirements at its ports. The sanitary organisation at the ports of this country has of recent years successfully met some very severe strains; experience has led to improvement in administration, and methods which in years gone by were found advantageous have, with changing conditions, been superseded by better ones: in this way quarantine has disappeared, and other methods substituted for it with advantage; the legislature has established certain distinctions with regard to the manner in which the Port Sanitary Authority, as the first line of defence, shall deal with different forms of infectious disease.

The ordinary forms of infectious sickness indigenous to this country are dealt with in precisely the same manner when imported by sea as they would be when imported by railway, or by other means of communication, and found in a dwelling-house in the City; but with certain forms of disease, endemic or epidemic at foreign ports—which, if introduced, might become grave sources of danger to the port to which they found access—special powers are given in order that the infected vessel may be detained long enough for the sick to be removed to a suitable hospital, the vessel to be properly disinfected, and the names and destinations of those on board ascertained. This arrangement obtains in the case of plague, cholera, and yellow fever, in regard to which the Local Government Board have issued comprehensive and stringent Orders which are calculated to meet the requirements of these cases.

Speaking broadly, the liability of infectious sickness to spread in any city is limited in proportion to the efficiency of the sanitation of the city. The broad policy of prevention which has been adopted in the seaports of this country, has been to sanitate the city, so that disease, when imported, say in the incubative stage, shall find no favourable habitat; consequently these forms of disease are deprived of the formidable character which they assume in cities in which the sanitation (in which term I include water supply, scavenging, hospital accommodation, drainage, character of the houses, and the like) is bad.

It is very generally known that a large section of the population in great seaports is of a shifting and variable nature. The demand for unskilled labour causes the congregation in seaports of the poorest class of labourer; employment is often irregular, and the wages consequently uncertain; thriftlessness, ignorance, and too commonly intemperance, add to the privations to which the casual labourers and their families are liable; large numbers of these people are lodged amidst unwholesome surroundings, and their frequent changes of abode augment the difficulties of dealing with them.

These classes are numerically, and from the point of view of sanitation, extremely important, since they are amongst those whose mortality is highest, are most liable to infection, and make the greatest demands upon the attention of the sanitarian.

Seaports then from their constitution call for all the energies which can be put forward to safeguard them from disease, they cannot afford to dispense with any one of the links in the chain armour which knowledge and experience provide.

Taking one consideration with another, perhaps the most troublesome disease to deal with is small-pox. As everybody knows, there is only one efficient preventive, and that is efficient vaccination.

One of the best vaccinated communities in the country at the present time is the parish of Liverpool, the latest published returns shewing that only 4 per cent. of children whose births are registered are unaccounted for in regard to vaccination. Perhaps it is to this circumstance that the remarkable immunity of Liverpool from small-pox has been owing. These results have been achieved amongst the peculiar population to which I have alluded largely through the medium of the vaccination stations. Hence it is that the closure of the vaccination stations has been viewed in Liverpool with much regret. It has been found recently in large numbers of cases that between the date of registration of birth and the time allowed for vaccination a large percentage of the families have removed. This will readily be understood by those who have knowledge of the migratory habits of this class, so that when the Vaccination Officers or the Public Vaccinator visits the address originally given, the people have gone and cannot be traced. Another fact for consideration is that out of 400 births registered consecutively in St. Martin's Sub-District, in 132 cases the person registering the birth could neither read nor write, even in these School Board days, so the information given to these people on the regulation forms is practically valueless. The labouring classes have been trained for many years to go to the vaccination stations, and even now, long after the closure of these places, people continue to go, and finding them closed come to the conclusion that vaccination is at an end.

But altogether apart from the damage which will ultimately result to the public health from any large neglect of vaccination, there comes the great and serious damage to the industry and commerce of the port, since the presence of any above a small number of cases is at once the subject of inquiry by foreign Consuls, and vessels coming from an infected port are liable to many restrictions, to the very grave prejudice of the trade.

These were among the considerations which led the Health Committee of the city to petition the Local Government Board to cause the Boards of Guardians to keep open the vaccination stations, the Boards of Guardians themselves being particularly desirous to do so, because of the admirable service these did not contribute anything at all towards the cost. They took it as a matter of course, and took no concern as to the kind of food the sailor got, or the cleanliness of the ship in which he sailed. Their experience in Hull was that the number of vaccinations had gone up enormously, not by thousands but by tens of thousands. In one place of business alone 1,200 persons were vaccinated. They found that vaccination was more readily conceded to by the public vaccinator visiting the homes of the people. It was a most inconvenient thing, and apart from its inconvenience, it was most insanitary and reprehensible to bring a crowd of women and children together, some with whooping cough, some with measles, some with skin diseases, and keeping them together for three, four, or five hours a day. It was much more sanitary, convenient and effectual for the public vaccinator to go to the house, taking with him his appliances.

Councillor **Solomon Cohen** (Hull) said they required greater co-operation in Port Sanitary matters, considering the enormous benefits conferred upon inland towns by preventing the spread of many of the most infectious diseases. The inspection and supervision given to all vessels arriving, not only those from infected places, entailed a large and growing expense upon local authorities which he thought it was only reasonable should be met by Imperial and not by local taxation. It was a question certainly deserving the attention of the Chancellor of the Exchequer; it therefore behoved all Port Sanitary authorities to bring it under his notice. They in Hull were safeguarding the health of the Midlands as well as of Yorkshire and Lancashire.

Dr. T. **Clarke** (Liverpool) said he believed Dr. Hope had no intention of advocating the public vaccination station as an entire substitute for vaccination from house to house. His contention was that as these stations had been in existence for many years, as the population of Liverpool was so very migratory and as many of the children registered could not be traced by the Vaccination Officer or the Public Vaccinator it would be well in the interest of the health of Liverpool that these places should be allowed to exist. He could testify from personal knowledge that many of these people had gone to private dispensaries where vaccination was indifferently performed. So far as the prevention of small-pox was concerned vaccination performed at private dispensaries was absolutely worthless. It created a feeling of security where none should exist. One other point referred to was the callousness of ship owners as regards the health of and accommodation for their crews. He thought possibly the strictures had been somewhat too severe. There was the ship owners point of view. He had to compete not only with fellow shipowners in England, but what was now a very serious matter with foreign shipowners, and he thought experience would bear him out in saying that the accommodation provided by British shipowners was infinitely superior to that provided by foreign owners. Then, again, they must remember that a large number of foreign nations in order to advance the interests of marine commerce subsidised their shipowners, so there again British shipowners were somewhat handicapped, and he had heard the Imperial authority subsidising local port sanitary authorities and recognising that their work was in the interest of the general community. To his mind there was one fatal objection to this, and that was that Local Government Board interference would follow in its train.

Councillor J. **Chatburn** (Grimsby) said Dr. Hope had stated that since the quarantine disappeared, legislation had stepped in and had given them special powers to deal with plague, cholera, and yellow fever. Could Dr. Hope see his way to advocate the same preventive measures being taken with regard to small-pox. They had heard from Dr. Fraser that small-pox had broken out at Hull because ships had taken it there, and it was just the same at Grimsby. They had had several cases there, and in each instance it had been brought in by shipping. The port sanitary authority took note of the cases, and thanks to the system of isolation they had there, they were able, to some extent, to stamp out the disease.

Dr. W. **Collingridge** (London) referred to the question of foreign competition which had to be faced by the British shipowner. He could not understand why foreign vessels should not be made fully amenable to all the details of the Public Health Act. There was no reason why British shipowners should be unfairly handicapped. The Public Health Act applied equally to British and foreign vessels while lying in British waters. The only exception to this is in the case of "any vessel under the command or charge of any officer "bearing Her Majesty's commission, or to any vessel belonging "to any foreign government." Surely, if the Public Health Act was to be enforced on the British vessel, it must also be enforced on the foreigner who is in competition. In London proceedings had been taken in many such cases.

Councillor W. H. **Allen** (Cardiff) emphasized the point made as to the inconvenience made in districts where there was a shifting population. While accepting all that had been said about the nuisance caused by house-to-house vaccination, special precautions were necessary where populations moved about so. He referred to the expense that the ratepayers of Cardiff were put to in regard to plague-stricken vessels, and said those wealthy people living in the suburbs immediately surrounding Cardiff got off absolutely free of cost. They had tried to extend their boundries, but had failed. The work of Port Sanitary authorities was surely the first line of defence of the country, and he should like a very strong expression of opinion to go from that Congress to the Government that they thought the time had come when the Government should consider the matter with a view to subsidising local authorities in protecting the sea ports of the country from infectious diseases.

Dr. E. W. Hope (Liverpool) replied that the discussion had been extremely interesting and had served to emphasise the fact that different places required different treatment in these special matters. Conditions applicable to Liverpool were not necessarily applicable to Hull or Cardiff or other places, and so far as the question of vaccination stations was concerned a greater necessity for them no doubt existed in Liverpool than in other places. As Dr. Clark had said, he did not desire to make vaccination stations everywhere compulsory, but to keep them in existence in towns where the Guardians and the sanitary authority desired them and the people had been accustomed to them for a number of years, and would, when they found the station shut up, think that vaccination was no longer in force. The objection raised in regard to vaccination stations appeared to him to have no weight at all. If it was improper to congregate a number of persons for the purpose of getting them vaccinated, it was equally improper to perform the work of vaccination in a small room with insanitary surroundings. With reference to the proposed contribution from the State towards the expenses of Port Sanitary Authorities, he took it that a port existed not altogether for the benefit of internal parts of the country, but also distinctly for the benefit of those who lived in it, and were attracted to it with the object of gaining a livelihood and carrying on their business, and who came there with the knowledge that there were risks incidental to the port, just as people went into a business knowing that there were risks incidental to such a business. He imagined that seaports must take upon themselves the burden of protecting their own community, although incidentally the country generally profited by the measures adopted. The proposal had already been put forward to deal with small-pox under regulations similar to those governing plague, cholera, and yellow fever, and the question had been discussed. Personally he did not think it would be an advantage to separate small-pox from the other forms of infectious diseases common to the country. The whole discussion had been an extremely interesting one, and had served to ventilate ideas on important subjects.

"*Precautions against the Introduction of Small Pox on Passenger Ships*," *by* Herbert Williams, M.D. Lond., D.P.H. Camb.

The scope of this paper might, with advantage, have been enlarged so as to include all ships, whether carrying passengers or not, for in my opinion there is more danger from cargo vessels than from passenger ships, inasmuch as there is almost invariably a surgeon carried by the latter, who would presumably diagnose a case of variola, or, at all events, isolate any case of

The question of the prevention of the introduction of small-pox by passenger ships is one which resolves itself into:—

(*a*) Preventing any such case occurring on a ship.

(*b*) Dealing with and taking adequate precautions to prevent this disease spreading when it occurs on board.

With regard to (*a*) an inspection of every person on board at the port of departure should be held conjointly by the port Medical Officer and the ship's surgeon. This inspection should not only be for the purpose of detecting cases of small-pox, but should extend so as to ascertain those persons who have been vaccinated, revaccinated and unvaccinated, with an account of the number and distinctness of the marks of the cicatrices in the case of those vaccinated.

Vaccination should be urged and performed at once before the ship sails, in the case of all unprotected persons. There should also be a daily inspection of all unprotected persons, and the ship should carry an ample supply of glycerinated calf lymph, reliable in quality.

At ports of call, where infection may be met with, only those persons adequately protected by vaccination should be allowed to land, unless that is their port of destination.

The ship's surgeon should inspect all men, and examine natives and stevedores who go on board for the purpose of coaling, with a view to detect cases of slight small-pox amongst them.

An officer should be constantly on duty at the gangway, and should inspect the face of each person coming on board. No one with an eruption, of whatever nature, should be allowed on board until he has been seen by the ship's doctor, and the nature of such eruption ascertained.

Should a case of small-pox unfortunately occur during the voyage, it should at once be isolated. The best place for this purpose is in the after-part of the ship, preferably on the upper deck of the poop, where a small temporary hospital should be constructed.

Each vessel should carry materials for this temporary hospital, which should be constructed chiefly of corrugated iron, with wooden joists and fittings. If this hospital were constructed and taken to pieces, each piece being numbered, it could be easily fitted up in an hour or so, temporary accommodation for the patient or patients being found perhaps in one of the boats slung over the quarter. This hospital should be sufficiently large to accommodate not only the patient or patients, but the attendant.

The food and other necessaries could be conveyed to a part of the deck, say ten feet from the hospital, and fetched from there by the attendant. When returned they should be immersed in a bucket containing some efficient disinfectant. Certain articles—*e.g.*, plates, dishes, knives, and forks—might be kept in the hospital for the use of the patient and attendant.

A steam disinfector should be carried on board all passenger ships. The place occupied by the patient before removal to hospital should be adequately disinfected. Efforts should be made to vaccinate and revaccinate all persons on board, more especially those who have been exposed to infection. These latter should be removed to a separate part of the ship and confined there during the incubation period, unless they consent to be and are successfully vaccinated.

The captain should have power to send ashore without compensation all those persons who refuse to avail themselves of the protective properties of vaccination, unless, of course, they have been revaccinated within seven years.

This may seem a harsh measure, but when the diffusive properties of the contagion of small-pox are taken into consideration, and when a case occurs on a ship, where it is practically impossible to get away from the risk of infection, those people, who are willing to undergo the inconvenience of vaccination thus protecting themselves and minimising the risk of spreading the disease amongst their friends, should receive the protection from such risk which would be afforded by the removal of all those persons who are liable to contract this disease, *i.e.*, those persons who refuse to avail themselves of the protective power of vaccination.

On arrival of a vessel in any port in this country on which a case of small-pox has occurred, and as a very large percentage of ships carrying passengers also carry a surgeon, a case of small-pox should not escape detection, the port authorities would be made acquainted with the fact on arrival. No person should be allowed to board or leave the vessel without permission of the Medical Officer of Health, and the medical officer of the local authority should have power to confine every person to the ship until the cases have been removed, and he has satisfied himself by inspection that no other cases have occurred on board. Vaccination should be offered to each person. Each person with their clothing should be disinfected before leaving.

On arrival of any vessel in this country from any port where small-pox exists, or is suspected to exist, she should not receive pratique until she has been visited by a medical officer, and he has satisfied himself that there has not been a case of variola on board during the voyage.

The vessels would be divided into two classes:—

1. Those where no case has occurred.
2. Those where variola exists or has existed on board.

1. In the former case if the voyage from the suspected port has lasted say, fifteen days, and there is no illness, the vessel should be allowed to proceed; and if she is less than fifteen days from port, the names and addresses of all unprotected persons should be taken and notified to the Medical Officer of Health of the place to which they are proceeding.

2. Where variola has occurred, or exists, the first step is to moor the vessel at some appointed place, remove the sick to hospital, land all persons who have been in contact with patients, for purposes of disinfection and vaccination.

Vaccination should be offered to all persons on board, and a record made of their protective condition, as ascertained, by date of vaccination and re-vaccination, number and distinctness of cicatrices.

The name and address of all persons on board should be taken for transmission to the Medical Officer of Health of the place to which they are proceeding; such notification should inform him as to the nature of the disease to which the passenger has been exposed and the protective condition of such passenger.

All effects infected or which have been exposed to the risk of being infected should be landed and disinfected by heat.

In investigating cases of reported illness on board ship, there are two symptoms which are common at the onset of small-pox and which are reported under different names by the captain. I refer to—Rigors and pain in the back.

A common sea complaint is a cold, and this term is applied by the captain to all those who shiver and complain of feeling unwell.

Another thing complained of is lumbago, so that where cases of illness are reported with the two symptoms of cold or freezing and lumbago they should be invariably the subject of investigation by a medical officer.

In the Port of London there is always a medical officer on duty at Gravesend, who accompanies the officer of Her Majesty's Customs to all vessels arriving from foreign ports, and so every case of illness or suspected illness is investigated by him; but in many out-ports the sole protection rests in the veracity of the captain, and on the intelligence and discretion of the customs officer. Bearing in mind the fact that the captain can always shelter himself, when detected, in not reporting a case of illness, which turns out to be some infectious disorder, behind the statement "that he is not a doctor," and that this also applies to the boarding officer, who is frequently a customs boatman or a coastguard, and whose object generally is to get through his spell of duty with as little trouble to himself as possible, it cannot be too promptly recognised that where there is not a medical officer present, the protection from the introduction of infectious disorders is a very slight barrier indeed.

I, therefore, desire to bring before this meeting the desirability of the Local Government Board adding small-pox to the diseases of plague, yellow fever, and cholera, as regulated by their Order.

Additions should be made by enforcing vaccination of all unprotected persons who have been directly exposed to risk of infection. Heavy penalties for any captain or surgeon who fails to report every case of illness which has occurred on board during the voyage should be inflicted.

A comparison of small-pox, with the three diseases before mentioned, is interesting.

The guiding principle which the Government of this country had in opposing quarantine and substituting the system of medical inspection, removal to hospital, disinfection and notification, was the knowledge that owing to improved conditions of sanitation, to use this word in its most comprehensive meaning, if a single case of plague, yellow fever, or cholera, did pass through the cordon at our ports, the conditions necessary for the propagation and growth of these diseases have been so diminished that the material for its growth into an epidemic does not exist, so that medical inspection at our ports suffices; but: How does it stand with small-pox?

Owing to the apathy, indifference, not to say fanaticism, and the introduction of the political element into the question, there are at present large numbers of children especially unprotected by vaccination, and if a mild case of variola were imported and brought into contact with some of these children, there are all the elements present for a large epidemic; and when one remembers the large mortality amongst unprotected children, and the fact that a large number of those attacked by variola, even if they recover, are so marked and disfigured as to considerably diminish their commercial value as citizens of this great empire.

Dr. W. **Collingridge** (London) said he could conceive that an arrangement carried out on the lines of Dr. Harker's suggestion would be of immense value in a port where they had to deal with smooth water, and could bring the launch alongside a vessel and allow her to remain sufficiently long for disinfection to be carried out, and some ports in England were so constituted that that would be the proper and efficient way of dealing with the question: but there were other ports where it would not be possible in anything like rough weather. Dr. Harker laid great stress on the point of time. Everything in regard to dealing with ships and shipping was a question of expense, and time is money, so that when one talked about keeping a vessel two days for a case of small-pox the thing became utterly and absolutely impracticable. That would mean detaining twelve large vessels at Gravesend, say, in a crowded tideway. There was only one way of doing it, either they must take the ship to the disinfector or take the disinfector to the ship, and the geographical position of the port must decide which of these two courses was to be adopted. At Gravesend they could not bring the disinfector to the ship, while, on the Tyne, this could be easily done.

Alderman Dr. **Fraser** (Hull) thought that if some scheme such as that suggested by Dr. Harker could be carried out, a great good would be done. He thought if there was some scheme of taking unvaccinated people and vaccinating them on board ship, it would be a good thing.

Councillor **Millington** (Hull) said they found the launch they had in use a great expense. In looking at Dr. Harker's plan he thought some better accommodation should be found for the crew. Dr. Collingridge had referred to the greatest stumbling block in sanitary work, and that was vested interests, but, of course, he was picturing what would happen if this arrangement were carried out.

Mr. J. R. **Daniels** (Whitstable) said he had often been struck by Dr. Collingridge's activity on the Thames, and he knew something about the Tyne and the Tees. He had the management of something like forty coasting vessels, and he knew it had been the case where a coaster had carried small-pox from Scotland to the South ot England. Although there was every vigilance and activity in the principal ports of the conntry, it seemed to him that the smaller ports were entirely neglected. He instanced a case in which one of the crew of a small coasting vessel, who was sickening with the small-pox, went ashore, spent the evening at the local public-house, and in a short time no less than thirteen cases of small-pox were traced to that one house.

Dr. W. E. **Harker** (Tynemouth) replied on the whole of the discussion, and elaborated his description of the launch. He said the saving of time was of great importance to both shipowners and to the Port Sanitary officials, and he believed that with his launch a vessel would be disinfected as efficiently as by the present methods in one-third or a quarter of the time. No infected clothing need be taken ashore for disinfection, and, while the vessel was absolutely disinfected, she need not have had any connection with the shore, and that was a most important point. A launch of this description would cost £1,900; a launch for ambulance purposes alone would cost from £1,300 to £1,400.

"*What can we do to improve Jack's lot,*" *by* Miss E. Bell.

ABSTRACT.

"A LIFE of practical and voluntary banishment," such is the life of the sailor. Here to-day; gone to-morrow. What time or opportunity has he for the enjoyment of those blessings which an Englishman regards as his birthright? A very Esau, he roams the world, and is scorned for his nomadic tendencies by those who cannot know what his deprivations must be.

I think, were it necessary for me to excuse myself for introducing Jack as he *really* is to your notice, that excuse could be found in the columns of the daily press, which during the early months of the year literally teemed with accounts of frightful trials and noble deeds of daring. Huddled into the most inconvenient quarter of the ship, badly ventilated and worse lighted; open to the incursions of his comrades at any time day or night. Too often dirty and evil smelling, in this uninviting abode what chance has the ordinary seaman to practice those methods of order and cleanliness which we ashore consider indispensable? But, argue some of the owners we have changed all that; we have built baths, and, in some cases, even started a library for the men, and they do not appreciate it. All honour to the owners who *have* instituted these reforms, and I can only say that if the men do not at present appreciate these improvements it is a pitiful indication that bad conditions have produced an indifference to sanitary and social ameliorations in the older men of which the rising generation of seamen will be only too glad to avail themselves.

If the following recommendations were carried out, I venture to say the health of all aboard ship would be vastly improved:

1. Some provision (especially on boats carrying a certain number of passengers) for bathing.

2. Separate sleeping accommodation for the cook and steward. In some cases these *have* berths either amidships or aft; but it is no uncommon thing for the cook to sleep in the forecastle, and he is scarcely ready to turn out at four o'clock the following morning—it must be remembered that the forecastle is the meal-room, concert-room, and general habitat of all the men.

3. The provision of a certificated cook and steward for every sea-going vessel, so that the food, plentiful in quantity, may be prepared in a more wholesome and appetising manner. And in this connection, I am glad to say another port—*i.e.*, Hull—is starting a nautical school of cookery, from which properly qualified cooks may be procured. It is to be hoped that, before many years have passed, every port of any importance will have its own nautical school of cookery. Those at present in existence, but four—*i.e.*, Tyne, at North Shields; London, at the Sailors' Home, Wells Street; Hull, at the Sailors' Rest; and Liverpool, in Colquitt Street—are quite inadequate to cope with the demand for certificated men required throughout the country.

4. The regular and systematic inspection of provisions aboard ship by qualified persons. There is a clause that the Board of Trade may inspect provisions; but the small number of officials employed and the restrictions of Legislature making it not only difficult, but in some cases impossible, to seize offending provisions. Except it can be proved to be a public nuisance under this clause more honored in the breach than in the observance, I would here humbly suggest that properly-trained lady inspectors would do the work not only as efficiently, but with, shall I say, more tact. Were the provisions inspected I maintain that it would be an advantage not only to the little family aboard ship, but also to the owner, who would have an official, free of cost to himself, looking after his interests in seeing that he did not pay for provisions which were never put aboard, and the general public as well. So true is it that the welfare of one is intimately blended with the well-being of all.

5. The teaching of ambulance to the sailors, and the proper use of such drugs as are sent aboard. The Board of Trade order certain remedial agents to be carried, but the average sea captain knows little of their use and application. The commander of every vessel has the well-being and well-doing of every member of the crew absolutely under his control whilst at sea. I would suggest that ships' officers before taking their master's certificate show, at all events, a knowledge of simple remedies in cases of accident or sickness. In large vessels,

where a surgeon is carried, this may be less needed; but with the bulk of our trading ships the captain is the sole authority, and it cannot be too strongly insisted on that he should be fitted to his post. Many a poor fellow has lived a painful life or gone to a premature death, because human life and its preservation was of less importance than the safe carriage and disposal of cargo.

6. On the question of space in the forecastle, and not only the forecastle, but also the officers' quarters, I need say nothing. It is well known that this is less than we allow to our workhouse inmates, or worse criminals. I might mention that some firms are taking the matter boldly in hand, giving their men greater spaceage, also a mess-room, and last, but not least, each officer a separate sleeping cabin. When we consider that a large percentage of our merchant ships' officers come from refined homes, I think it must be evident to all who understand the conditions which obtain in many boats, that we shall not much longer have this class of men to draw upon unless we improve their conditions aboard ship, as to food, accommodation, sanitation, and hours of recreation. When building new vessels, I have been assured by both builders and owners, that the extra cost of such improvements would be infinitesimal.

To sum up. I cannot help thinking were the conditions aboard ship improved as suggested, we should hear less of the "Disappearance of the British Sailor," the manning question, and so forth. The health of the men would be improved, and if we teach the men to respect themselves, we are making better men of them, and consequently better sailors.

I cannot remember where the following verse occurs, but it rather aptly describes the situation :—

"The Lord let the house of a brute to the soul of a man ;
  And the man said, 'Am I your debtor ?'
The Lord answered, 'Not yet, but make it as clean as you can,
  And then I will find you a better.'"

Mr. J. R. **Daniels** (Whitstable) as a sailing ship master referred to the importance of members of the crew being taught "first aid" and ambulance work, and mentioned a case where a man had died simply through there being no one on board who could administer "first aid." He suggested that all counties which had a seaboard and seaports should see that the Technical Education Committee of the respective County Councils should make "first aid" one of the subjects of education, and that sailors should be taught this as well as other subjects that are taught to landsmen.

Mr. **Spooner** dwelt on the importance of the inspection of food, and said that on all ships sailing to foreign ports there should be someone who had passed an examination in administering "first aid," and the best way to ensure that was to see that mates, when applying for a master's certificate, produced evidence that they had passed such an examination. At present, if they had passed that examination, the fact was endorsed on the master's certificate, and it might have a good effect in getting them appointments.

Alderman J. **Foster Spence** (Tynemouth) spoke of his personal knowledge of Miss Bell's work, and said the subject of her paper was really a national question, and one which affected the health of our sailors very much—more than any of them thought. Referring to the importance of efficient cooking, the speaker said that great quantities of food were thrown overboard simply because they were spoilt in the cooking. If they could only get shipowners to take up this question, and if the Board of Trade could by any means see their way to make it compulsory that the cook of a vessel should hold a certificate of efficiency a great deal would have been achieved. Bad cooking was, no doubt, a principal factor in the illness of seamen.

RESOLUTIONS PASSED AT THE CONGRESS HELD AT SOUTHAMPTON, 1899.

RECOMMENDATIONS MADE IN SECTION I. :—

"That in the opinion of the meeting, the early recognition and the prevention of Tuberculosis as well as of certain other communicable diseases, would be expedited and made surer were a rudimentary knowledge of the laws that govern the spread of infective diseases properly taught in all schools throughout the country."

Decision of Council.—That the resolution be forwarded to the Education Department, as a corollary to the memorial recently sent by the Council, emphasing the desirability of giving instruction in schools in the Laws of Health and Disease.

"That this meeting in view of the resolution it has just passed requests the Council of the Sanitary Institute to draw the attention of the President of the Council of Education to the good likely to follow the practical adoption in rate-aided schools of the proposal contained in the first resolution."

"That the Council of the Sanitary Institute be recommended to endeavour to secure similar action on the part of other Associations and Societies interested in the subject."

"That it be a recommendation to the Council of the Sanitary Institute to make a representation to Government that it is at the present time of great importance to the health and trade of the empire that a Commission consisting of experienced Physicians, Epidemiologists and Bacteriologists, be appointed to visit the Continent and study on the spot the peculiarities of the present outbreak of Plague in its epidemiological, prophylactic, and curative aspects as modified by its conditions in Europe, and that immediate steps should be taken by the Government to provide such a supply of Haffkine's prophylactic and the other curative serums, as will meet the urgent wants of our seaports."

"That the Council of the Sanitary Institute be recommended to urge the Government to undertake a scheme for the reduction of the prevalence of Bovine Tuberculosis."

"That the Council of the Sanitary Institute be recommended to endeavour to secure similar action on the part of other Associations and Societies interested in the Subject."

Decision of Council.—To make representation to the Government on behalf of the Institute, embodying the substance of the resolutions bearing on the subject.

RECOMMENDATION MADE IN SECTION III.—

"That this Section request the Council of the Sanitary Institute to consider the advisability of requesting the Local Government Board to relax the requirement they usually make, insisting on District Councils providing land for the treatment of sewage effluents (before sanctioning loans for sewage disposal purposes), in cases in which efficient contact beds are arranged for."

Decision of Council.—That it appears inopportune to take action until the Royal Commission, now sitting, has reported.

RECOMMENDATIONS MADE IN THE CONFERENCE OF MUNICIPAL REPRESENTATIVES:—

"That in the opinion of this Conference the Licensing of Common Lodging Houses should, in the interest of Public Health, be subjected to Annual Revision, and that the Council be requested to take any steps necessary to further this proposal.

Decision of Council.—To approve the recommendation, and to forward it to the Local Government Board.

"That in the opinion of this Conference the desirability of establishing Joint Committees for Watershed Areas is necessary, and they recommend to the Council of The Sanitary Institute that they should further the objects proposed in Major Flower's paper by action in proper quarters."

Decision of Council.—This recommendation had already been approved and acted upon in connection with the Conference on River Pollution convened by the Institute in Feb., 1899.

RECOMMENDATION MADE IN THE CONFERENCE OF MEDICAL OFFICERS OF SCHOOLS:—

"That this Conference begs to appeal to the Council of The Sanitary Institute to recommend the Council of the Medical Officers of Schools Association, to take under consideration the protection of School Milk Supplies, and if they approve to draw up a code of recommendations for this purpose."

Decision of Council.—To communicate with the Society on the subject.

RECOMMENDATIONS MADE IN THE CONFERENCE OF VETERINARY INSPECTORS:—

"That the Council of The Sanitary Institute be recommended to urge the Government to undertake a scheme for the reduction of the prevalence of Tuberculosis."

Decision of Council.—That the recommendation is covered by previous resolutions.

"That the Council of The Sanitary Institute be recommended to urge the Government to take steps by which the adoption of the Provisions of the Cowsheds, Dairies, and Milk Shops Order should be made compulsory by the Local Authorities.'

Decision of Council.—That the recommendation appears to have been framed under some misconception of the present state of the law.

ARTICLES RELATING TO PUBLIC HEALTH,

Appearing in the chief British and Foreign Journals and Transactions.

Abstracts of Titles classified in this List under the following headings:—

Science in Relation to Hygiene and Preventive Medicine.
Hygiene of Special Classes, Trades, and Professions.
Municipal Administration.
Building Materials, Construction, and Machinery.
Water Supply, Sewerage, and Refuse Disposal.
Heating, Lighting, and Ventilating.
Personal and Domestic Hygiene.

Science in relation to Hygiene and Preventive Medicine.

COLES, C., M.D. The Bacillus of Influenza. *British Medical Journal*, 4th November, 1899, p. 1284.

The methods of examining sputum for the bacillus, are discussed together with the question whether it can be recognised with sufficient certainty to render clinical aid in doubtful cases.

MAXWELL, J. L., M.B. The Relation of Bacillus Coli Comm unis to other Organisms in the Urine. *British Meicald Journal*, 25th November, 1899, p. 1472.

Cases are quoted in support of the conclusion that the bacillus coli, although it may not be a primary cause of infection in bladder inflammations, is frequently found to entirely replace cocci.

WOHLMANN, A. S., M.D. Bacteriology of Rheumatic and Allied Diseases. *British Medical Journal*, 11th November, 1899, p. 1348.

A summary is given of the results obtained by numerous investigators as to the bacteriology of acute rheumatism and pernicious arthritis.

KEMNA, AD. Asterionella. Une étude de biologie hydrologique. *La Technologie sanitaire*, 1 Decembre, 1899. p. 221.

An investigation of asterionella: its presence and effects upon drinking water; analysis.

Lewkowitsch, J., Ph.D. The Meaning of the Acetyl Value in Fat Analysis. *The Analyst*, December, 1899, p. 319.

A continuation of a paper on "The Acetyl value," read before the Society of Chemical Industry in 1897. Further explanatory directions of the processes employed, and an extended series of experiments are given in the present paper.

Wijs, J. J. A. On the Determination of the Iodine Value. *The Analyst*, February, 1900, p. 31.

Deals with the "iodine values" of different oils.

Welburn, E. W., L.R.C.P., F.G.S. Geology: Its Practical Application in Sanitation. *The Journal of State Medicine.* December, 1899, p. 777.

Sufficiently indicated in the title.

Bastianelli, Dr., and Biguame, Dr. A. Malaria and Mosquitoes. *The Lancet*, 13th January, 1900, p. 79.

The question of the part played by mosquitoes in the propagation of malaria is discussed, and hints as to preventive measures are given which are founded upon observations and experiments as to causation.

Berry, H. Poole, M.B. Summer Diarrhœa: Its Probable Cause. *The Lancet*, 21st October, 1899, p. 1090.

Arguments are introduced which favour the theory that summer diarrhœa is a specific fever, due to an organism which is located in the soil, its growth being dependent upon a certain soil temperature.

Buchanan, W. J., M.B. Dysentery as a Terminal Symptom of Disease in the Tropics. *British Medical Journal*, 9th September, 1899, p. 653.

A short history of twenty-eight cases is given, and the question is afterwards discussed by Drs. Manson, Macleod, and Sambon.

Campbell, Colin, M.R.C.S. The Technique of Vaccination. *British Medical Journal*, 2nd September, 1899, p. 578.

The difficulties experienced by public vaccinators in carrying out the Local Government Board instructions under the new Vaccination Act are discussed, and suggestions are offered as to how they may best be overcome.

Crosse, W. H., M.R.C.S. Eng. The Histology and Prevention of Black-water Fever. *The Lancet*, 6th January, 1900, p. 11.

The Author differs from Kock in considering that black-water fever is not due to malaria parasites, and describes the disease as an intoxication of malarial origin. To prevent malaria the only practicable means is to find, if possible, an animal which is inimical to the mosquito, and introduce it into malarial districts. To prevent black-water fever attend to general health, take quinine, and leave malarial district.

DUCKWORTH, Sir DYCE, M.D. Notes on a Case in which Antityphoid Inoculations were practised. *British Medical Journal*, 18th November, 1899, p. 1407.

The symptoms are described which followed two inoculations, in two cases the finger blood gave Widal's reaction.

FORBES-LESLIE, W., M.B. The Typhoid Fever of Malarial Countries: Some Remarks and Suggestions on its Pathology and Treatment. *The Lancet*, 28th October. 1899, p. 1153.

Variation in symptoms attributed to malaria. Malarial enteric fever not so fatal as European; convalescence is more rapid and perforation of intestine is rare.

FOWLER, J. K., M.D. The Arrest of Pulmonary Tuberculosis. *The Lancet*, 12th August, 1899, p. 399.

Figures are given of post-mortem records in proof of the comparative frequent recovery from pulmonary phthisis; the process of healing of the lung tissue is discussed, the open air treatment is advocated.

GROVES, JOS., M.B., and others. A Discussion on the Personal Communication of Tuberculosis and the Measures available for its Prevention. *British Medical Journal*, 2nd September, 1899, p. 580.

HUGHES, M. LEWIS, L.R.C.P., and HEALEY, C. W. R., L.R.C.P. An Acute Epidemic of Gastro-enteritis attributed to Food Poisoning. *The Lancet*, 4th November, 1899, p. 1223.

More than thirty cases, of which three proved fatal, cheese being suspected, although not proved to be the cause.

HUTCHINSON. W., M.D. The Local Distribution of Tubercle in various Species. *British Medical Journal*, 11th November, 1899, p. 1350.

The question is discussed and conclusions are arrived at, chiefly as the result of post-mortem examinations at the Zoological Gardens, London.

KÖRÖSY, JOSEPH DE. School Attendance and the Propagation of Croup-Diphtheria. *The Journal of State Medicine*, February, 1900, p. 106.

Sufficiently indicated by title.

Macleod, Kenneth, M.D. On Thermic Fever (so-called Siriasis), with special reference to its alleged Microbic Causation. *British Medical Journal*, 9th September, 1899, p. 649.

A discussion followed the reading of the paper at the Annual Meeting of the British Medical Association, 1899.

Manson, P., M.D. On Filarial Periodicity. *British Medical Journal*, 9th September, 1899, p. 644.

The question is discussed of the causes which lead to the presence of filaria in the cutaneous circulation during the night and their absence during the day, when they are found in some large arteries and organs (principally the lungs), but not in the liver and spleen.

Nuttall, George, M.D. The Rôle of Insects, Arachnids, and Myriapods in the Propagation of Infective Diseases of Man and Animals. *The Lancet*, 16th September, 1899, p. 775.

Numerous observors are quoted in support of the theory that insects, etc., play an important part, either active or passive, in the production of bacterial and parasitic diseases, and a table is given of animal parasites and their hosts. See also *British Medical Journal*, September 9th, 1899, page 642.

Payne, J. F., M.D. The Pathology of Milk. *British Medical Journal*, 11th November, 1899, p. 1341.

The results are given of 186 microscopical examinations of samples of milk for pus, tubercle bacilli, or other micro-organisms or cells. Pus, or muco-pus and streptococci, were found in no less than 80 per cent. of mixed samples.

Pearse, F., F.R.C.S. Some Points in the Pathology of Plague. *British Medical Journal*, 11th November, 1899, p. 1350.

The author concludes that glandular and sub-cutaneous swellings in cases of plague are not explained by the local inoculation theory, but by "a selective action to destroy the virus of the disease."

Seaton, E. C., M.D., and others. A Discussion on Recent Vaccination Legislation and the Prevention of Small Pox. *British Medical Journal*, 2nd September, 1899, p. 576.

Smith, W. R., M.D., D.Sc., F.R.S. Edin. Diphtheria (The Second of the Harben Lectures). *The Journal of State Medicine*, February, 1900, p. 65.

Deals almost exclusively with the subject of the spread of the disease through school attendance.

STALKARTT, W. H. S., M.D. Hœmoglobinuric Fever and Paludism. *British Medical Journal*, 9th September, 1899, p. 654.

The writer is inclined to think that black-water fever is a distinct disease, and not a symptom of malaria or the result of quinine treatment. Various opinions were expressed in a discussion which followed the reading of the paper.

THIN, GEO., M.D. Psilosis or Sprue: Its Relations (Etiological and Pathological) to other forms of Tropical Diarrhœa and its Treatment. *British Medical Journal*, 9th September, 1899, p. 637.

The reading of the above paper was followed by a discussion at the Section of Tropical Diseases, British Medical Association Annual Meeting, 1899.

THRESH, J. C., M.D., and WALTER, E. R., M.R.C.S. Report on an Outbreak of Typhoid Fever at Shoeburyness attributed to Eating Cockles. *British Medical Journal*, 16th December, 1899, p. 1669.

History given of twenty-three cases which occurred in a terrace of nine occupied houses, in which, by a process of exclusion, the cause was attributed to eating cockles which were proved to be contaminated by sewage which was infected by typhoid discharges.

THOMPSON, J. ASHBURTON, M.D. Leprosy in Madeira. *The Lancet*, 30th September, 1899, p. 885.

History of leprosy in Madeira given, and Dr. Julius Goldschmidt's views are discussed. From the history of the past twenty-six years, and the presence of only seventy cases on the island, notwithstanding the absence of proper isolation, the author seems to doubt the accuracy of Dr. Goldschmidt's conclusions as to the contagious nature of the disease so far as association with patients is concerned.

TURNER, A. J., M.D. The Diphtheria Mortality of the Three Principal Australian Colonies for the past fifteen years. *British Medical Journal*, 18th November, 1899, p. 1409.

Statistics are given for eleven years previous to the introduction of the antitoxin treatment, and for four years afterwards with the result that the treatment seemed to have proved more effective in Australia than in England.

WILD, R. B., M.D. Some Sources of Infection in Cutaneous Tuberculosis. *British Medical Journal*, 11th November, 1899, p. 1353.

Several cases are quoted with reference to the probable source of infection, and the opinion formed is that all cases of cutaneous tuberculosis are due to local inoculation.

Wright, A. E., M.D., and Lamb, Geo., M.B. Observations bearing on the Question of the Influence which is exerted by the Agglutinins in the Infected Organism. *The Lancet*, 23rd December, 1898, p. 1727.

The title of the paper indicates its scope as far as can be done in a limited space.

Hygiene of Special Classes, Trades, and Professions, and Municipal Administration.

Marsden, R. Sidney. M.D. Overcrowding in Secondary Schools. *British Medical Journal*, 2nd September, 1899, p. 584.

Attention called to frequent overcrowding, and suggestions that Medical Officers of Health should have the same power with regard to schools (private or otherwise) as they possess under Factories and Workshops Act.

Newsholme, Arthur, M.D. A Discussion on the Means of Preventing the Spread of Infection in Elementary Schools. *British Medical Journal*, 2nd September, 1899, p. 589.

Reid, Sir Hugh Gilzean. New Year's Address of the President of the Sanitary Inspectors' Association. *The Builder*, 13th January, 1900, p. 40.

Chiefly refers to the improved dwellings for the working classes in London and Edinburgh, and to sanitary progress in the mining villages of Durham.

Hebb, H. K, J.P. Thirty-three Years' Sanitary Work in Lincoln. *The Surveyor*, 11th August, 1899, pp. 166-7.

The highways; history of city authorities, sewerage and sewage; Lincoln Waterworks Act, 1871; Street improvements.

Manby, E. P., M.D. Meat Inspection and the Abolition of Private Slaughter-houses. *British Medical Journal*, 2nd September, 1899, p. 581.

Abolition of private slaughter-houses advocated, or their compulsory closure with or without compensation according to circumstances.

Woodward, W. C., M.D. Garbage Disposal and Street Cleaning. *Engineering Record*, 14th October, 1899, p. 458.

The advantages of refuse disposal being carried out by municipalities without intervention of contractors.

Building Materials, Construction and Machinery.

Blashill, Thomas, F.R.I.B.A. The Architect in Relation to Fire Prevention. *Journal of the Royal Institute of British Architects*, 23rd December, 1899, p. 57.

To suggest to architects to study the causes of fire in buildings; to use fire resisting materials; to convince clients and the public of the urgency of precautionary measures, and to work cordially with municipal authorities. A discussion followed, in which Mr. Arthur, Cates, Mr. D. S. Waterlow (Chairman of the Building Act Committee, L.C.C.), Sir John Taylor, K.C.B., Mr. W. E. Riley (Sup. Arch., L.C.C.), Mr. E. O. Sachs (Chairman of the British Fire Prevention Committee), &c., took part.

Cooper, A. S. The Effect of Salt Water on Cement. *Building News*, 27th October, 1899, pp. 541-3.

Results of experiments to determine the effect of salt water used in gauging and for immersion; description of tests; results of tests; conclusions; effect of size of sand on cement mortar; time of set.

Elford, Ernest J. Notes on Portland Stone. *The Surveyor*, 8th September, 1899, pp. 276-7.

Description of various beds in Island of Portland.

Tillson, G. W. The Life of Pavements. *Engineering Record*, 21st October, 1899, p. 477.

Factors affecting the life of granite, asphalte, and wood street paving.

Water Supply, Sewerage, and Refuse Disposal.

"Builder," Editor of The. The London Water Commission's-Report. *The Builder*, 3rd February, 1900, pp. 99-102.

An editorial article.

Elford, Ernest J. New Portland Water and Main Drainage Works. *The Surveyor*, 1st and 8th September, 1899, pp. 246-7 and 275-6.

Water works; analysis of water; description of the works and construction thereof; drainage works; division into four districts for drainage purposes; description of works in each district.

Harris, Gordon, A.M.I.C.E. Water Supply to Country Mansions and Estates. *The Surveyor*, 8th December, 1899, pp. 673.

The high cost of old methods of raising water. Gravitation scheme preferable. Cost of pumping by various powers. Well boring. Water supply for fire extinguishing, &c.

Harvey, T. F. The Merthyr Waterworks. *The Surveyor*, 29th September, 1899, pp. 361-2.

Pentwyn reservoir. Lower Neuadd reservoir. Upper Neuadd reservoir. Rainfall. Description of works.

Ingham, William. The Incrustation of Iron Pipes at the Torquay Water Works. *Engineering*, 3rd November, 1899, p. 575.

The water supply of Torquay and neighbourhood. Reduction of delivery through incrustation of mains. Method of cleansing by scrapers. Summary of results and analyses.

Kiersted, Wynkoop, M.Am.Soc.C.E. Sedimentation Basins for Waterworks. *The Engineering Record*, 28th October, 1899, p. 506.

Sedimentation of water with aid of coagulants. Construction of basins (illustrated).

Meade-King, W. O. E., M.Inst.C.E. Local Government and its relation to Parish Water Supply and Sewerage. *The Surveyor*, 2nd February, 1900, pp. 128-9.

Duties of local authority with respect to water and sewage. Opposition to schemes. Cost of schemes. Water supply. Sewerage and sewage disposal. Water supply and sewerage combined. Conclusion.

Moss-Flower, T. J., A.M.Inst.C.E. The Sources of Underground Water Supply. *The Surveyor*, 11th August, 1899, pp. 167-8.

Obtaining reliable sources. A good and efficient supply. Wholesomeness and palatableness. Physical conditions.

Ramsay, Professor, **Rideal**, Dr., **Crookes**, Sir W., **Clowes**, Professor, **Frankland**, Professor, and **Boyce**, Professor. Water and Sewage Examination. Report of British Association, 1899, p. 255.

Report of committee (as above) appointed by British Association for the advancement of science to establish a uniform system of recording the results of the chemical and bacterial examination of water and sewage.

Thresh, J. C., D.Sc., M.D. The Protection of Surface-Water Supplies. *The Journal of State Medicine*, December, 1899, p. 802.

Advocating: (1) The utmost possible control of the watershed or collecting area; (2) Very ample storage; (3) Sand filtration.

LOWE, G. M., M.D. The Action of Sun and Air in the Purification of Surface Waters. *The Surveyor*, 18th August, 1899, p. 196-7.

Elementary facts relating to air and water. River water and its purification. The theory of filtration. The biological position.

PARRY, W. KAYE, M.Inst.C.E. The Purification of Polluted Water. *The Surveyor*, 15th December, pp. 684-5.

Address to the Students of the Engineering School of Dublin University.

Difficulties of sewage disposal. Variable character of sewage. Rainfall. Modern methods of disposal. The sludge problem.

TATTON, REGINALD A., M.Inst.C.E. The Purification of Water after its Use in Manufactories. *Engineering*, 12th January, 1900, p. 61.

Polluted condition of Mersey and Irwell watershed. Manufactories where trade waste is efficiently treated. Description of these works.

SCHÖNHEYDER, WILLIAM. Water Meters of the Present Day, with Special Reference to Small Flows and Waste in Dribbles. *The Surveyor*, 9th February, 1900, pp. 157-9.

Classes of water meters. Low pressure meters. Inferential meters. Capacity meters. Waste detection meters. Positive meters. Tests of four water meters.

BALL, CHAS. B., M.Am.Soc.C.E. Is a House Sewer Trap always necessary? *Building News*, 15th December, 1899, pp. 792-3.

Conditions necessary to assure speedy flow of sewage to sewers. Objections to intercepting trap, Use of trap. Reasons for retaining it. American practice.

GARRETT, HENRY A. Refuse Disposal and the Results obtained from a Six Months' Working of the Refuse Destructor at Torquay. *Engineering*, 18th August, 1899, p. 215.

Previous reports and tests upon "Destructors." Cremation the only satisfactory way of dealing with refuse. Primary object of destructor. Types of destructors. Cost of treatment of refuse. Torquay destructor. Component parts of refuse. Tests as to power generated.

RUSSELL, C. NEWTON, A.M.Inst.C.E. Combined Refuse Destructors and Power Plants. *Engineering*, 29th December, 1899, p. 843.

Refuse destruction in reference to raising steam. The Shoreditch destructor.

Average cost per annum of burning the refuse average calorific value of various tests. Amount of energy required, &c.

Angel, R. J., A.M.Inst.C.E. The Sewerage and Sewage Disposal of Walsall. *The Surveyor*, 13th October, 1899, pp. 424-5.

Town sewers, surface water sewers, illustrations of types of manholes, hydraulic sewers, sewer ventilation, sewage disposal, precipitation works, filter beds.

Clark, H. W. Recent Lawrence Experiments in Sewage Disposal. *The Engineering Record*, 23rd December, p. 696.

Experimental work on bacterial treatment of sewage.

Dennis, Nelson F., A.M.Inst.C.E. The Biological Treatment of Sewage at Aldershot. *The Surveyor*, 27th October, 1899, p. 495.

Nature of Aldershot sewage. The filter beds.

Description of the process at Aldershot. Analysis of sewage and effluent.

Fuertes, James H., M.Am.Soc.C.E. The Sewerage of Edinburgh, Scotland. *The Engineering Record*, 13th January, 1900, p. 29.

Description of sewage disposal at Edinburgh.

Mawbey, E. G., M.Inst.C.E. Sewer Ventilation. *The Surveyor*, 28th July and 4th August, 1899, pp. 104-5 & 131-2.

A comprehensive report on sewer ventilation, recently submitted to the Highways Committee of the Leicester Corporation, with recommendations as to efficiently ventilating the Leicester sewers.

Scobie, H. T. The Bacterial Treatment of Sewage. *The Surveyor*, 16th February, 1900, pp. 184-5.

Composition of Sewage. Bacteria. Various systems of sewage disposal. The Dibdin system. The septic tank. Systems and experiments.

Thresh, J. C., D.Sc., M.D. The Liernur System of Sewerage and Sewage Treatment. *The Surveyor*, 8th September, 1899, pp. 283-4.

Report to the Tendring Rural District Council.

Description of works at Trouville. Advantages and disadvantages. System of treatment. Question of cost.

Heating, Lighting, and Ventilating.

Monroe, William S. Modern Practice in Steam Heating and Ventilation. *The Engineering Record*, 18th November, 1899, p. 581; 30th December, 1899, p. 730; and 17th February, 1900, p. 158.

Chapter IV., Indirect radiators — Circulation in radiators. Chapter V., Design of radiation. Chapter VI., Piping and construction details.

Dee, Thos. G. Prevention of Smoke. *The Sanitary Inspectors Journal*, September, 1899, pp. 197-8.

The theory of combustion and development, and decomposition of coal with history of application of modern furnace thereto, and the law thereon.

Emden, W., J.P. The Amendment of the Law as to Light and Air. *Building News*, 12th January, 1900, p. 54.

Necessity for an alteration in present laws. Defects in present laws. Suggestions for remedying present state of affairs by constitution of a technical court.

Personal and Domestic Hygiene.

Annett, H. E., M.D. Boric Acid and Formalin as Milk Preservatives. *The Lancet*, 11th November, 1899, p. 1282.

As the results of experiments which are described, the conclusion is arrived at that such preservatives in milk are injurious, particularly in the case of young infants.

Foulerton, A. G. R., F.R.C.S. Eng. The Influence on Health of Chemical Preservatives in Food. *The Lancet*, 25th November and 9th December, 1899, pp. 1427 and 1577.

Experiments, &c., point to conclusion that, except for invalids and children, the addition of boric acid and formic aldehyde to milk would not cause injurious effects. The author is of opinion, that if added either to milk or other food, the fact should be declared, and the amount should not exceed what may be sanctioned by the Local Government Board or Board of Agriculture.

Liebrich, Oscar, M.D. The so-called Danger from the Use of Boric Acid in Preserved Foods. *The Lancet*, 6th January, 1900, p. 13.

Arguments are brought forward which tend to throw doubt upon the accuracy of the conclusions of Drs. Annett and Robinson regarding the injurious effect of boric acid as a food preservative.

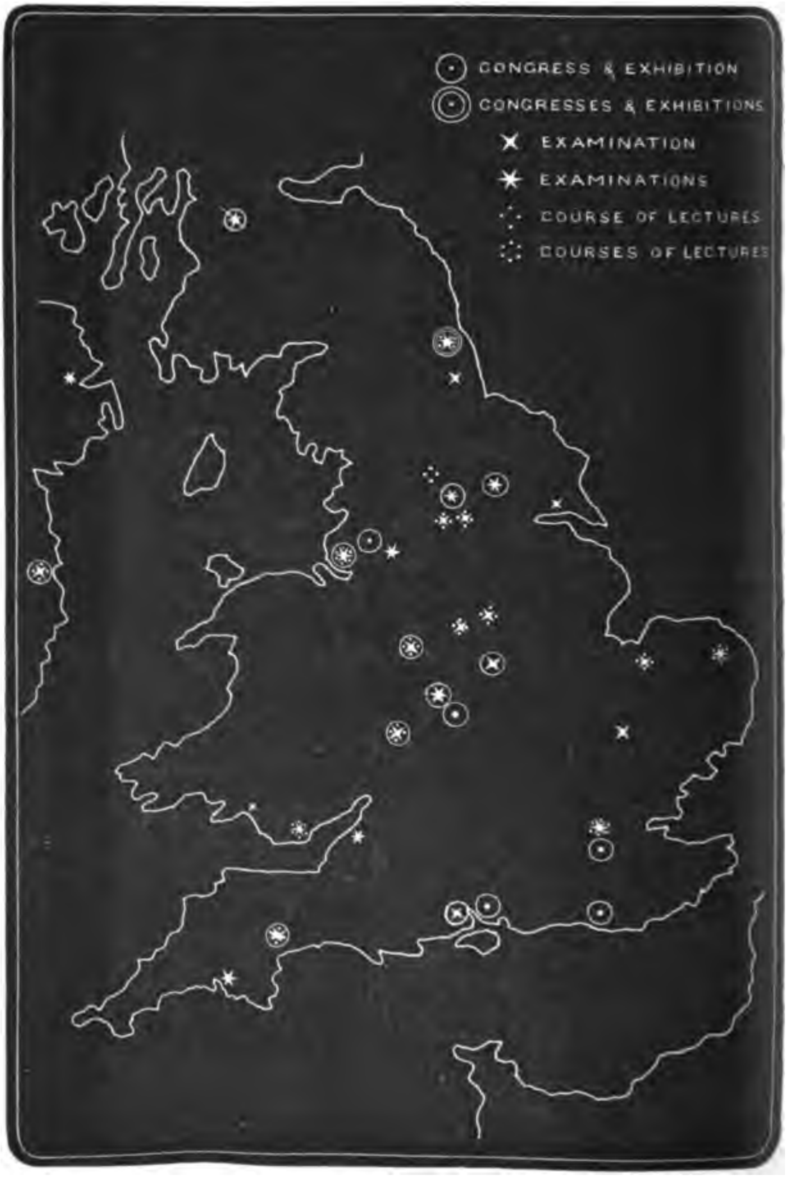
Fuertes, James H., M.Am.Soc.C.E. The Disinfecting Station at Zurich. *The Engineering Record*, 11th November, 1899, p. 553.

Description of disinfection arrangements at Zurich (Illustrated).

Van Ermengem, M. le Dr. E. Expériences de désinfection des locaux par la méthode de Breslau. *La Technologie sanitaire*, 15 Novembre, 1899, p. 189.

Experiments upon cultures with formaline under conditions occurring in practice.

Map showing the various centres to which the work of The Sanitary Institute has been extended.



Congresses, 18. Examinations, 188. Courses of Lectures, 45.

ANNUAL REPORT OF THE COUNCIL

FOR THE YEAR 1899.

Read at the Ordinary General Meeting, March 21st, 1900.

INTRODUCTION.

The Institute has been established for nearly a quarter of a century, and in natural progress of time those to whom the Institute owes its origin are passing away. During the past year the Institute has lost its first President, the Duke of Northumberland, who presided at the meeting at which the Institute was inaugurated, and during the sixteen years of his presidency contributed in many ways to the advancement of the Institute. The Duke of Westminster, who followed him as President and liberally contributed to the support of the Institute, has also passed away, and Sir Douglas Galton, who was Chairman of the Parkes Museum, and for many years also Chairman of Council of The Sanitary Institute, who devised the Scheme of amalgamation between the two bodies, and to whose wise counsel and active interest so much of the progress of the Institute has been due, was a loss which the Institute felt severely. The Council have also lost among their former colleagues Mr. J. Wallace Peggs, Sir Richard Thorne Thorne, Dr. T. W. Grimshaw, and Mr. T. J. Dyke.

NEW PREMISES.

The question of additional premises for enlarging the Museum and extending the work of the Institute has received the careful consideration of the Council during the past year. For the present they have renewed the leases for another ten years of the Museum and offices now occupied, but feeling that these are scarcely adequate to the increasing work of the Institute, they have decided to start a Building Fund. His Royal Highness the Duke of Cambridge, President, considers this a happy and wise proposal, which he hopes will be supported by the members of the Institute. £5,000 of the invested capital of the Institute has been alloted as a nucleus of this fund, and further donations have already been received, It is proposed to place all donations for this object to a special reserve fund, but for the present, at all events, to carry the interest on the capital so allotted into the general receipts of the Institute.

A very considerable sum, probably about £25,000, will be required for the Building Fund, and it is therefore hoped that the members will individually support and press forward by every means in their power this most desirable end, and thus secure on a broader and firmer basis the assured public utility of the Institute.

ASSOCIATED WORK.

During the year an Association has been formed, under the Presidentship of His Royal Highness the Prince of Wales, for the prevention of Consumption and other forms of Tuberculosis. A number of those who have taken a prominent part in the subject are associated with the work, and at a meeting in December an influential general Committee was formed, and an Executive appointed, for making arrangements for an International Conference on the subject to be held in 1901.

The Smoke Abatement Society inaugurated by Sir W. B. Richmond, has made a commencement of its work by issuing a circular calling attention to the provisions of the Law on the subject.

A Royal Commission has been appointed to enquire into the various methods of treating and disposing of sewage. The members appointed on the Commission were:—The Right Hon. Earl of Iddesleigh, Sir Richard Thorne Thorne, Major-General C. Phipps Carey, C. P. Cotton, Esq., Michael Foster, Esq., Thomas Walter Harding, Esq., Thomas William Killick, Esq., William Ramsay, Esq., Dr. James Burn Russell.

CONFERENCE ON RIVERS POLLUTION.

In February a Conference on the subject of River Pollution was organised by the Institute. The chair was taken by Sir Francis Sharp Powell, Bart., M.P., Vice-President of the Institute, and there was a very representative attendance, including many members of Parliament, Medical Officers of Health, River Inspectors, and Engineers especially interested in the subject. Resolutions were passed dealing with the question of inspection of the sources of supply and the appointment of representative authorities for dealing with each gathering ground or group of gathering grounds in the Kingdom, and supporting the Rivers Pollution Bill to be introduced by Sir Francis Sharp Powell. The Resolutions are set out on page 277, Vol. XX., of the Journal of the Institute, and a copy of them was transmitted to the Local Government Board.

SANITARY LEGISLATION.

The Institute had under consideration the following Bills introduced into Parliament during the year. The action taken by the Council and the fate of the Bill is noted in each case:—

Adulteration (Food Products) Bill. Brought in by Mr. Kearley, Mr. Maurice Healy, Mr. Lough, Sir James Kitson, Mr. Schwann, Mr. Woods, and Mr. J. Wilson (Govan).

A Bill to consolidate and amend the law relating to the sale of food and drugs.

This Bill was dropped.

Bakehouses Bill. Brought in by Mr. Woods, Mr. J. Burns, and Mr. Steadman.

A Bill to restrict the hours of labour in Bakehouses to forty-eight per week.

This Bill was dropped.

The Board of Education Act. Brought in by the Duke of Devonshire and Sir John Gorst.

This Act, passed at the end of the Session, is worthy of comment, as it contains a clause relating to the provisions made in schools for the health of the scholars. This Clause if wisely interpreted may do much to introduce sanitary practice as an environment of child life.

Infectious Disease (Notification) Act (1889) Extension. Brought in by Sir Francis Sharp Powell, Mr. Hobhouse, Dr. Farquharson, and Mr. Knowles.

A Bill to extend the Infectious Disease (Notification) Act, 1889, to districts in which it has not been adopted.

This Bill was passed and received the Royal assent.

Local Government Act (1888) *Amendment Bill.* Brought in by Mr. Bigwood and Mr. Howard.

A Bill to amend the Local Government Act, 1888.

The Bill was withdrawn.

London Government Bill. Brought in by Mr. Balfour, Mr. Chaplin, Mr. Attorney General and Mr. Solicitor General.

A Bill to make better provision for Local Government in London, by the re-arrangement of local areas in London for municipal purposes and the formation of such areas into Metropolitan Boroughs, each to be governed by a Mayor, Aldermen, and Councillors.

This Bill was passed and received the Royal assent.

Metropolis Management Acts Amendment (Bye-Laws) Bill. Brought in by Lord Monkswell.

A Bill to amend the provisions of the Metropolis Management

Acts with respect to Bye-Laws, authorising the London County Council to make Bye-Laws for the following purpose:—

Requiring persons about to construct, reconstruct, or alter drains in connection with buildings, to deposit with the sanitary authority of the district, plans, sections and particulars as may be necessary for the purpose of ascertaining whether such construction, reconstruction, or alteration is in accordance with the statutory provisions relative thereto, and with any Bye-laws made under the said section except as to alteration of drains in case of emergency.

This Bill was passed and received the Royal assent.

Oysters Bill. Brought in by Lord Harris.

A Bill for the protection of public health against dangers arising from the consumption of unwholesome oysters.

The Council petitioned in favour of the Bill introduced in the House of Lords, but not brought down to the Commons.

Plumbers' Registration Bill.

The Institute appointed representatives to a Conference called by the National Association for the promotion of Technical and Secondary Education, to consider this proposed Bill. There was a large attendance of representatives from examining and educating bodies, and a draft Bill, drawn on behalf of the Plumbers' Company, was brought forward for consideration, but having regard to the division of view manifested at the meeting, it was decided that no further steps be taken in the prosecution of such measure.

Public Health Acts Amendment Bill. Brought in by Sir Alfred Hickman, Sir Walter Foster, Mr. James Heath, Mr. Ernest Spencer, and Mr. Baldwin.

A Bill to amend the Public Health Acts. The Council petitioned in favour of the Bill.

The second reading was not reached.

Sale of Food and Drugs Bill. Brought in by Mr. Long, Mr. Solicitor-General, and Mr. T. W. Russell.

A Bill to amend the law relating to the Sale of Food and Drugs.

This Bill was passed and received the Royal assent.

Seats for Shop Assistants (England and Ireland) Bill. Brought in by Sir John Lubbock, Mr. Cameron Corbett, Dr. Farquharson, Sir James Fergusson, Mr. Field, Mr. Kearley, Sir Francis Powell, Sir William Priestley, and Mr. Tennant.

A Bill to provide for Seats being supplied for the use of Shop Assistants in England and Ireland.

The Council petitioned in favour of the Bill.

A similar Bill was introduced for Scotland.

A general Bill, without limitation of place, was passed, and received the Royal assent.

Vaccination (Conscientious Objectors) Bill. Brought in by Mr. Boulnois, Sir John Lubbock, Mr. Whitmore, Sir H. Seymour King, Mr. Coghill, Mr. Duncombe, Sir Reginald Hanson, and Mr. Hozier.

A Bill to repeal Section 2 of the Vaccination Act, 1898.

The Council petitioned in favour of the Bill.

The Bill was dropped.

Water Supply Bill. Brought in by Mr. Cornwallis, Colonel Warde, and Mr. Boscawen.

A Bill to amend the Law respecting the Supply of Water by Companies and other bodies and persons.

The Council petitioned in favour of the Bill, and suggested that the provision in the Bill for the Examination of Water by Analysis should be extended to include a bacteriological examination.

The Bill was withdrawn.

Rivers Pollution Prevention Bill. Brought in by Mr. Wilson Todd, Sir Francis Powell, Mr. Wyvill, Mr. Henry Hobhouse, Sir John Dorington, Sir Henry Howarth, Dr. Farquharson, Sir John Brunner, and Sir Walter Foster.

A Bill to make more effectual Provision for prevention of the Pollution of Rivers and Streams. The Council petitioned in favour of this Bill, but suggested that the clause relating to solid matter in suspension should be so amended as to include this as a pollution. The second reading was dropped.

SESSIONAL MEETINGS.

Sessional Meetings for the discussion of subjects of Sanitary interest were held in February, March, April, and December, and the following subjects were brought forward:—

"London (Welsh) Water Supply." R. E. MIDDLETON, M.INST.C.E., M.INST.M.E.

"The Establishment of Public Abattoirs in the Metropolis in Relation to the Prevention of Tuberculosis. W. A. BOND, M.A., M.D., D.P.H., M.R.C.P.

"Practical Hygiene Teaching in Elementary Schools." Miss RAVENHILL.

"The Health of Scholars: with special reference to the Education Code and the Board of Education Act, 1899." ARTHUR NEWSHOLME, M.D., F.R.C.P.

The papers read during the early part of the year, with the discussions upon them, have already appeared in the Journal, Vol. XX. The paper by Dr. A. Newsholme will be published in Part I. of the Journal for 1900.

The Council will be glad to receive from time to time notice of any subjects which are thought desirable for discussion.

LECTURES AND DEMONSTRATIONS ON SANITARY SCIENCE.

In the Autumn the Course of training was very considerably extended, in order: 1, To cover the subjects contained in the syllabus for the Examination in Practical Sanitary Science held by the Institute; 2, To provide instruction for candidates for the Meat Inspectors' Examination; and 3, To cover the subjects and requirements of the syllabus of the Sanitary Inspectors' Examination Board *(formed by The Sanitary Institute and other bodies)*. To meet the convenience of candidates the Course was divided into three parts, which could be taken separately.

At the twenty-seventh course in February and March 55 Students entered their names, and at the twenty-eighth course in October and November 56 Students.

A complete list of the Lectures has been given in Vol. XX. of the Journal.

Technical Exhibitions are awarded by the Technical Education Board of the London County Council to the annual value of five pounds, which may with the approval of the Board, be applied to paying the expenses of students in attending these lectures.

INSPECTIONS AND DEMONSTRATIONS.

Arrangements were made for the Students to visit the places mentioned below in order that they might have the opportunity of observing and noting the difficulties that have to be met in the practical application of Sanitary principles to various trade processes. The names of the gentlemen who arranged the visits and conducted the students are also given:—

John Knight and Sons, Silvertown Soap Works. By kind permission of the Proprietors.

East London Water Works, Lee Bridge. By kind permission of W. B. BRYAN, M.INST.C.E., Engineer to the Company, who conducted the Students.

Friern Barnet Sewage Works. By kind permission of E. J. Reynolds, assoc.m.inst.c.e., Surveyor to the District Council, who conducted the Students.

Barking Sewage Outfall Works. By kind permission of J. E. Worth, m.inst.c.e., District Engineer, London County Council, who conducted the Students.

Southwark and Vauxhall Water Works, Hampton. By kind permission of J. W. Restler, m.inst.c.e., Engineer to the Company.

Demonstrations in the Parkes Museum of Book-keeping, as carried out in a Sanitary Inspector's Office. Given by Albert Taylor, Chief Sanitary Inspector of St. George's, Hanover Square.

East London Soap Works. By kind permission of E. Cook & Co.

Morden Hall Dairy Farm. By kind permission of, and conducted by, the proprietor, Oscar J. White (2 inspections).

Aylesbury Dairy Co. By kind permission of J. A. Hattersley, Managing Director.

Ealing Sewage and Destructor Works. By kind permission of Chas. Jones, m.inst.c.e., Engineer and Surveyor to the District Council (2 inspections), who conducted the Students.

Beddington Sewage Irrigation Farm, Croydon. By kind permission of Thos. Walker, m.inst.c.e., Borough Engineer, who conducted the Students.

Sutton Sewage Works. By kind permission of the Town Surveyor, C. Chambers Smith, who conducted the Students.

Wimbledon Sewage Works and Farm. By kind permission of C. H. Cooper, m.inst.c.e., Engineer and Surveyor to the District Council, who conducted the Students.

Knacker's Yard. By kind permission of Messrs. Harrison & Barber.

Metropolitan Cattle Market. By kind permission of the Corporation of the City of London. Conducted by W. A. Bond, m.a., m.d., d.p.h., Medical Officer of Health, Holborn (2 inspections).

Disinfecting and Filtering Appliances at the Lambeth Disinfecting Station. By kind permission of Joseph Priestley, m.d., d.p.h., Medical Officer of Health. Conducted by Wolf Defries, b.a.

Disinfecting Station, Chelsea. By kind permission of **Louis Parkes**, M.D., D.P.H.LOND., Medical Officer of Health, Chelsea Vestry, who conducted the Students.

St. George's, Hanover Square, Sanitary Works in different stages of progress, Disinfecting Station, Mortuary, &c., Model Dwellings (Gatliff Buildings), and Routine Office Work of a Sanitary Inspector. By kind permission of the Vestry. Conducted by A. **Taylor**, Chief Sanitary Inspector (4 inspections).

London County Council's Common Lodging House, Parker Street, Drury Lane, by kind permission of the Council. Conducted by **Frank** J. **Ruddle**, Estates and Valuation Dept., L.C.C. (2 inspections).

Richmond Main Sewage Works. By kind permission of W. **Fairley**, ASSOC.M.INST.C.E., Engineer, who conducted the Students.

Disinfecting Apparatus and Model Steam Laundry. By kind permission of W. G. **Lacy** (2 inspections), who conducted the Students.

Marylebone Stoneyard. By kind permission of the Surveyor. The Students were conducted by C. J. **Kilgallin**.

Demonstration of Diseased Meat in the Parkes Museum. By W. A. **Bond**, M.A., M.D., D.P.H., Medical Officer of Health, Holborn (2 demonstrations).

During the period over which each course of Lectures extended the Students had the free use of the Library and Museum at all times when they were open, and special times were set apart during each week for the Students to examine the Museum with the assistance of the Curator.

The Council desire to record their sincere thanks to the Lecturers for the great benefits they have conferred upon the Students, and for the assistance they have given to the diffusion of Sanitary knowledge by the preparation and delivery of these Lectures, and also to those gentlemen who took so much trouble to make the various inspections and demonstrations visits instructive to the Students.

The Institute is also indebted to the London County Council, Vestries and District Councils, and others who are so kindly assisting them with regard to the visits, and in bringing the lectures under the notice of their officers.

EXAMINATIONS.

During the year two new Examinations have been established by the Council. One for Inspectors of Meat and other Foods, the other in Practical Hygiene for School Teachers.

The Examination for Inspectors of Meat was arranged in order to give effect to the recommendation of the Royal Commission on Tuberculosis, and the order of the Local Government Board issued on this Report. The syllabus of the Examination has been submitted to the Local Government Boards in England, Scotland, and Ireland, and they have expressed their approval of its sufficiency. The first Examination has been held, and from the practical nature of the Examination and the candidates who presented themselves, the Council believe that it will become popular and serve a very useful purpose.

The Examination for School Teachers appeared to the Council to be an appropriate outcome of the endeavours which they have been making to get hygiene recognised as a definite subject in the code for elementary schools, and, moreover, the Board of Education Act, 1899, arranges that the Board may inspect schools for the purpose of ascertaining the provisions made for the teaching and health of the scholars. If any adequate preparation is to be made by the schools which would fit them for such inspection, it is obvious that a larger knowledge of the laws and principles of hygiene is necessary on the part of the teachers in such schools. The Examination has been very well received, and the School Board for London have decided to accept the Certificate of The Sanitary Institute for the purposes of the Board's Certificate of Proficiency in Physical Education, as equivalent to the advanced Certificate of the Science and Art Department in Hygiene. Although at first there are not a very large number of candidates, the Council believe that the Examination may be the means for furthering the objects for which the Institute was founded, by getting the practice of hygiene established as an environment of the school life of the nation, a period which so largely influences the national character.

The scheme devised by the Local Government Board for the formation of a Sanitary Inspectors Examination Board, for the purpose of conducting Examinations under the Public Health (London) Act, 1891, was completed in February, and the new Board was incorporated under the title of The Sanitary Inspectors Examination Board (*formed by The Sanitary Institute and other bodies*), with the following object: To institute examination of persons desirous of obtaining a certificate of competency for the office of Sanitary Inspector or Inspector of Nuisances for the purpose of Section 108 (2) (d) of the Public Health (London) Act, 1891, or any subsequent Act of Parliament or order of the Local Government Board which may require Sanitary Inspectors or Inspectors of Nuisances to hold certificates, and to grant such certificates.

The Board, as at present constituted, consists of 12 members, 2 being appointed by The Sanitary Institute, 3 by the Local Government Board with the assent of The Sanitary Institute, the remainder being one representative each from seven other Societies interested in the work. The constitution also provides that if additions are made to the Board in future the Representatives of The Sanitary Institute shall remain as nearly as practicable five-twelfths of the Board. It is also secured by the Memorandum of Association that all the candidates who passed the Examination of the Institute (2,822) before the end of December, 1898, shall be entered on the Register of the new Board.

The Board held their first Examination in December, at which 19 candidates presented themselves; 2 failed in the preliminary examination in Education, and out of the remaining 17, 16 passed the Examination. All the candidates who had attended the Lectures at The Sanitary Institute were among those that passed.

The Sanitary Institute is continuing, on the same lines as before, examination for Inspectors of Nuisances under the Public Health Act, 1875.

EXAMINATIONS IN PRACTICAL SANITARY SCIENCE.

During the year Examinations were held at the following places: London (2 Examinations), Birmingham, Belfast, Cardiff, Bristol, Glasgow, York, Liverpool, Manchester. 37 Candidates presented themselves, to 11 of whom Certificates were granted.

FOR INSPECTORS OF NUISANCES UNDER THE PUBLIC HEALTH ACT, 1875.

Belfast.
Birmingham.
Bristol.
Cardiff.
Glasgow.
Liverpool.
London (2 Examinations).
Manchester.
Newcastle-upon-Tyne.
York.

At these Examinations 477 Candidates presented themselves, and 251 were certified competent, as regards their Sanitary knowledge, to discharge the duties of an Inspector of Nuisances under the Public Health Act, 1875.

For Inspectors of Meat and Other Foods.

The first Examination was held in London in December; 13 candidates presented themselves, to 9 of whom certificates were granted.

Examinations were established by the Institute in 1877, and the following figures show the total number of Examinations held, and the number of candidates:—

	Examinations.	Candidates Entered.	Candidates Certificated.
For Local Surveyors	35	291	142
Practical Sanitary Science....	34	237	112
Inspectors of Nuisances	118	5,401	3,073
Inspectors of Meat and Other Foods	1	13	9
	188	5,942	3,336

A Diagram relating to the Examinations for Inspectors of Nuisances is given on the following page.

CONGRESS AND EXHIBITION.

The Eighteenth Congress and Exhibition of the Institute was held at Southampton from August 29th to September 2nd, by invitation of the Mayor and Corporation.

Very suitable accommodation was provided for the meetings of the Congress in the Hartley Institution, Municipal Offices, and King Edward VI. Grammar School.

Delegates were appointed by 450 Sanitary Authorities and learned Institutions.

The numbers attending the Congress were as follows:—Members of Council, 22; other Members and Associates of the Institute, about 370; Associates of the Congress and Subscribers, 411; Delegates, 910; Press, 150; making a total attendance of over 2,000.

Twenty meetings were held during the Congress, and at these 93 addresses, lectures and papers were read, and fully discussed.

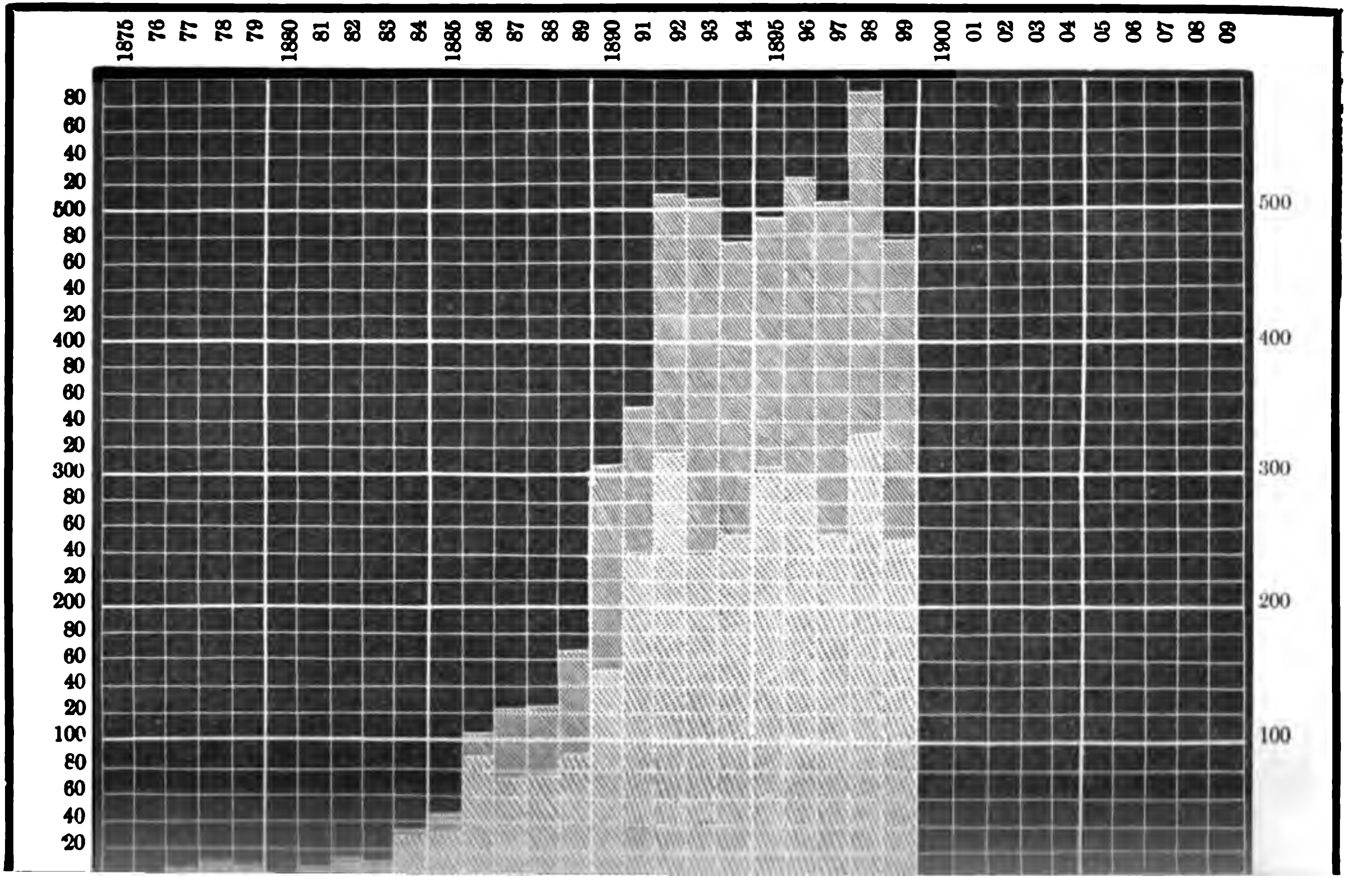
About 500 Ladies accompanied the Members and Delegates.

The meetings were divided into three Sections, meeting on the Thursday and Friday,

1. Sanitary Science and Preventive Medicine,
2. Engineering and Architecture,
3. Physics, Chemistry, and Biology;

and Conferences were arranged as usual for Municipal Representatives, Medical Officers of Health and Surveyors to County and other Sanitary Authorities, Engineers, Sanitary Inspectors, Ladies on Domestic Hygiene.

Conferences were also added for Port Sanitary Authorities, Medical Officers of Schools, and Veterinary Inspectors.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Among the subjects of special interest brought forward and discussed at the meeting, may be mentioned: Tuberculosis, and the provision of Sanatoria for consumptive patients; provisions for dealing with tuberculous cattle and milk; physical exercise for boys and for girls; the practice and teaching of hygiene in schools; the plague; and sewage treatment from an engineering and also a bacteriological point of view.

Most of the papers and discussions are published in the Journal of the Institute.

Interesting visits were made to the water works, sewage and refuse disposal works, isolation hospital, municipal lodging house, electric supply station, and other municipal works illustrating the sanitary administration of a large city. These visits, under the guidance of the responsible officers, are of great value to the members, and especially to the officers and members of local authorities and officials appointed as delegates to the Congress.

In addition to these a number of visits and well organised excursions of a social character were carried out by the Local Committee to Osborne House and grounds, Netley Hospital, New Forest. Archeological excursions, trips round the Isle of Wight, and other places near Southampton, were also arranged.

The Health Exhibition was held in Victoria Hall and Rooms, and was open twenty-three days. It was attended by 37,800 visitors. A list of the Exhibits, to which medals were awarded, is given in Part III. of the Journal for 1899, and also a list of certain Exhibits which required special tests in London or elsewhere before their merits could be decided upon by the Judges.

The Illustrated List of Exhibits, to which awards have been made, has been regularly published by the Institute since 1892. The list now contains illustrations, descriptions, and prices of a large number of sanitary appliances and articles of domestic use and economy, and is, the Council believe, of much use for reference.

Letters of Thanks from the Exhibition Committee have been sent to those who gave special assistance, and their names are given in the following list:—

Her Majesty's Ordnance Survey Department.
The Corporation of Southampton.
The Water Department of the Corporation of Southampton.
The Union Steam Ship Co.
Messrs. Lankester and Sons, Ltd.
Mr. A. Brown.
Miss Cole, Superintendent of the School of Cookery.

EXHIBITIONS HELD IN CONNECTION WITH THE CONGRESSES OF THE INSTITUTE.

	1877. Leamington.	1878. Stafford.	1879. Croydon.	1880. Exeter.	1882. Newcastle.	1883. Glasgow	1884. Dublin.	1885. Leicester.	1886. York.	1887. Bolton.	1889. Worcester.	1890. Brighton.	1892 Portsmouth.	1894. Liverpool.	1896. Newcastle.	1897. Leeds.	1898. Birmingham.	1899. Southampton
Exhibitors ...	117	116	189	106	110	126	134	135	130	112	108	108	156	146	100	145	107	121
Exhibits ...	294	319	710	500	600	750	900	1,000	900	800	800	1,000	2,000	—	—	—	—	—
Space occupied (in sq. ft.)	—	—	—	9,725	14,520	20,000	40,000	30,000	30,000 and Gr'nds	25,000	28,000 and Gr'nds	30,000 and Gr'nds	35,000 and Gr'nds	25,000	17,310 and Gr'nds	42,000	54,000	22,560 and Gr'nds
Days Exhibition was open ...	14	16	17	19	25	25	19	17	26	29	23	18	24	24	22	23	23	23
Total Visitors	—	—	—	8,955	8,373	20,000	35,000	37,000	30,000	27,000	23,000	35,000	49,000	48,189	51,000	75,700	85,000	37,800
Medals or Silver Medals.	13	13	12	12	15	21	18	34	16	14	30	32	21	29	[illegible]	15	18	11
Special Certificates ...	None.	6	9	7	4	13	11	11	12	9	Discon	tinued						
Certificates or Bronze Med'ls	None.	22	38	40	72	58	83	79	64	40	71	88	76	56	52	4	65	47
Exhibits deferred for further trial	—	7	52	30	37	44	30	119	42	46	67	67	38	59	44	26	34	19

PARKES MUSEUM.

There has been a steady increase in the number of students brought to the Museum by lecturers and demonstrators, showing an appreciation of the teaching value of the Museum. The following table shows comparative figures for the past eight years.

Table showing the number of Classes and Students visiting the Museum.

Date.	Institutions from which Classes attended.	Classes.	Students.
1892	13	68	854
1893	21	87	1043
1894	28	48	865
1895	50	93	1695
1896	49	82	1435
1897	53	138	1674
1898	47	97	1958
1899	40	97	2154

This Table shows an increasing use of the Museum for this purpose.

The following Institutions were represented, in some cases several classes having attended on different dates.

Architectural Association.
Barrett Street Board School.
Battersea Polytechnic.
Bedford College.
Blackheath Pupil Teachers' Centre.
Borough Polytechnic.
Borough Pupil Teachers Centre.
Brighton Training College.
Carpenters' Company's Institute, Stratford.
Charing Cross Hospital (Public Health Students).
Charterhouse School of Science.
Clyde Street Science Centre.
Croydon Polytechnic.
Eastbourne Technical Institute (Plumbers).
Friern Barnet Technical School.
Great Titchfield Street Technical Centre.
Guy's Hospital (Public Health Students).
Honeywell Street Board School.
Jenner Institute, Chelsea (Public Health Students).
King's College.
London Hospital (Public Health Students).
Maria Grey Training College.
National Health Society.
Northern Polytechnic.
Oak Hill School, Hampstead.
Old Kent Road Board School.
People's Palace (Architectural).
Regent Street Polytechnic.
Royal Veterinary College.
Rutland Street Board School.
St. Catherine's School, Tottenham.
St. George's Hospital (Public Health Students).
St. Mark's Board School.
St. Thomas' Hospital (Public Health Students).
Skinners' Company's School (Girls).
Surrey Square Board School.
Thornton Heath Institute.
University College (Public Health Students).
William Street Science Centre.
Wood Green Co-operative Society.

Considerable assistance was given to the students by the Curator, by demonstrating the various exhibits in the Museum.

A number of additions have been made to the Museum collection during the year. In each case the object has been accepted by the Committee as being of instructive interest, and a list of those accepted will be found in the Journal of the Institute.

A medium-pressure hot-water heating system has been fitted up in the Museum, affording an illustration of this method of heating, and also considerably adding to the comfort of those attending Lectures and Demonstrations in the Museum.

An exhibition of Models and designs of dust carts and waggons was arranged by the Institute in the Museum from August 16th to September 9th, at the suggestion of the London County Council, the models and designs having been sent in response to a premium offered by that Council. Mr. Henry Law, as Chairman of the Council of The Sanitary Institute, was asked to adjudicate upon the models and designs, in place of the late Sir Douglas Galton, who had previously been appointed. Three hundred and seventy-five plans, and fifty-three models were exhibited, and the exhibition was visited by 320 persons, including a number of sanitary officials in the metropolitan area. Photographs of the vehicles referred to in the awards made by Mr. Law are exhibited in the Museum.

The number of Lantern Slides loaned to the members of the Institute was 589, as against 726 in 1898. Several interesting slides have been added to the collection, and among these may be mentioned a set relating to hospital construction, kindly presented by Lady Galton, and some slides illustrating cases of small-pox.

LIBRARY.

Volumes and Pamphlets numbering 310 have been presented to the Library. Lists of these are published in Vol. XX. of the Journal.

The number of references made by general readers has increased during the year, but the Library has not been so largely used by those attending the lectures.

Altogether about 450 references were made to the shelves by readers during the year.

For the convenience of Members, Associates, and Students who wish to borrow books for home reading, special arrangements have been made for the loan to them, at a small fee, of books from Lewis's Medical and Scientific Library, which contains a large number of recent text books and standard Sanitary works.

ALTERATIONS IN ARTICLES OF ASSOCIATION AND BY-LAWS.

By Resolution of General Meeting in 1899, alterations were made in the Articles of Association for the following purposes:—

1. To enable the Council to register an increase in the number of Members, the limit of 1,000 being almost reached.

2. Making certain modifications in the qualifications entitling Members and Associates to a lower rate of subscription, and including Members residing abroad.

3. Making some modification with regard to the removal and reinstatement of Members and Associates.

4. Modifying the terms of the quorum required for a General Meeting.

These alterations are fully set out in the Journal on page 279.

An alteration has also been made in the By-Laws to enable any necessary addition to be made to the Board during the course of the year. The wording of the By-Law as altered is given in the Journal on page 697.

FINANCE.

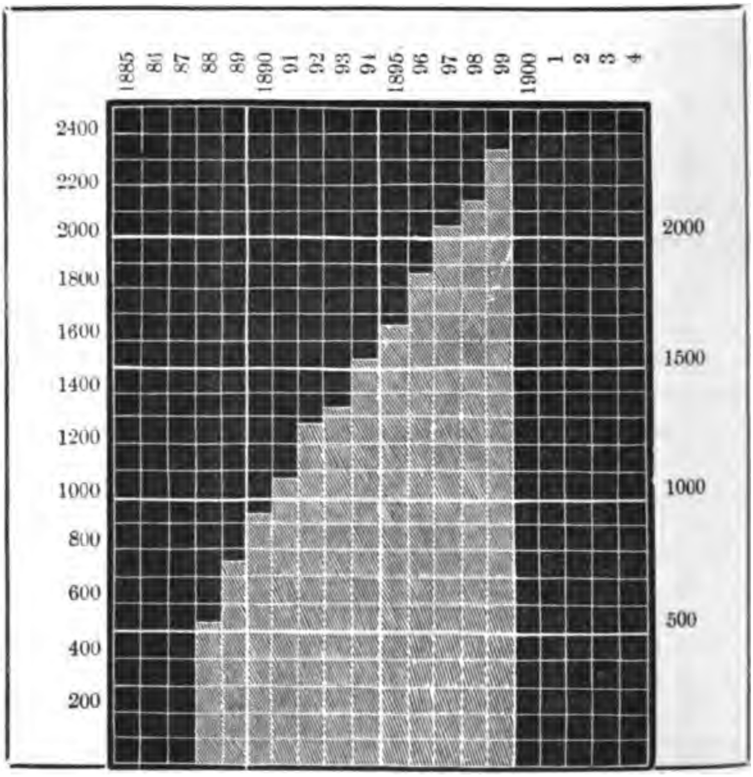
Appended to this Report is the statement of accounts for the year. Most of the items in the account show a steady improvement corresponding with the growth of the Institute, but owing to changes subsequent upon the establishment of the new Examination Board there has been a considerable decrease in the amount received for examination fees, and the balance of the Congress and Exhibition at Southampton available to meet establishment expenses was very small; the general result shows a balance of expenditure over receipts of £331 7s. 9d. It will be observed however on reference to the balance sheet that, including the amounts carried forward during the past three years, the Institute has the substantial balance of assets of £11,641.

EPITOME OF REGISTERS OF MEMBERS AND ASSOCIATES.

The comparison of the roll of the Institute with the preceding year shows a steady increase in the number of Members and Associates.

	Hon. Fellows.	Fellows.	Members.	Associates.	Total
Dec. 31st, 1898 ……	30	146	768	1186	2130
Dec. 31st, 1899 ……	35	157	842	1290	2324

Diagram showing the Yearly Increase in the Roll of the Institute.



OBITUARY.

It is with regret that the Council have to report the death of His Grace The Duke of Westminster, K.G., who was the second *President of the Institute;* Sir Douglas Galton, K.C.B., F.R.S., *Vice-President, Treasurer,* and *Chairman of Council;* T. J. Dyke, F.R.C.S., Lord Farrer, T. W. Grimshaw, C.B., M.D., J. Wallace Peggs, Assoc.M.Inst.C.E., Sir Richard Thorne Thorne, K.C.B., LL.D., F.R.S., and W. N. Thursfield, M.D., *Fellows;* G. R. Andrews, W. K. Burton, Assoc.M.Inst.C.E., T. L. Lewis, G. Nelson, J. W. Townsend, G. A. Watson, M.B., M.R.C.S., D.P.H., W. White, F.S.A., F.R.I.B.A., L. Wilde, M.D., M.R.C.S., D.P.H., and E. F. Woodward, *Members;* W. J. Chesterfield, H. Evans, W. F. Fordham, W. Hooper, J. Maclennan, Adam Morris, F. Redston, Miss M. E. Timberlake, T. Waters, and T. Woodhouse, *Associates.*

EPITOME OF THE WORK OF THE INSTITUTE, 1899.

	London Lectures and Examinations.	Total Attendance.
4	Sessional Meetings for discussion of Sanitary subjects ..	284
48	Lectures to Sanitary Officers	2,304
4	Special Demonstrations, Inspection of Meat	154
27	Practical Demonstrations for Sanitary Officers	578
2	Examinations in Practical Sanitary Science	18
2	Examinations for Inspectors of Nuisances	167
1	Examination for Inspectors of Meat	13
148	Council and Committee Meetings	745
97	Classes brought to the Museum	2,154
	Other persons visiting the Museum *(Estimated)*	7,500
	Exhibition of Dust Carts	320
	Provincial Examinations.	
8	Practical Sanitary Science	19
9	Examinations for Inspectors of Nuisances	310
	Congress and Exhibition at Southampton.	
6	Sectional Meetings	862
11	Conferences	782
3	Addresses and Lectures	754
	Exhibition open for twenty-three days, at which a number of Lectures and Demonstrations were given	37,800

HENRY LAW, M.Inst.C.E.,
Chairman of Council.

E. WHITE WALLIS,
Secretary.

March 14th, 1900.

STATEMENT of INCOME and EXPENDITURE

Dr. EXPENDITURE.

	£	s.	d.	£	s.	d.
Establishment Charges:—						
To Rent, Rates, Taxes, and Insurance	457	14	2			
„ Salaries and Wages	1,153	5	2			
„ Coals, Lighting, and Care of Offices	104	14	3			
„ Repairs, Alteration, and Arrangement of Museum	87	9	1			
„ Library, Binding, &c.	21	11	9			
„ Postage and Carriage	190	4	4			
„ Printing, Stationery, and Advertising	215	14	4			
„ Incidental Expenses	91	16	7			
„ Law Charges on Renewal of Lease	41	2	2			
„ Office Furniture	2	4	7			
„ Depreciation of Leaseholds	75	0	0			
				2,440	16	5
Special Expenses, exclusive of Establishment Charges:—						
To Journal and Publications, Cost of Printing, etc., less Sales and Advertisements	541	19	1			
„ Sessional Meetings	20	8	6			
„ Lectures, Sanitary Officers	179	1	9			
„ Examination Expenses	795	9	2			
„ Congress at Southampton	456	5	6			
„ Exhibition „	1,980	10	9			
„ List of Awards to Exhibits	54	12	11			
„ Investigations on the Septic Tank	44	15	7			
„ Institute Dinner—Balance of Expenses	36	0	2			
				4,109	3	5
				£6,549	19	10

	£	s.	d.
To Depreciation of stock of Publications on hand	97	10	0
„ Balance for the year brought down	331	7	9
Balance to be carried forward	11,641	16	8
	£12,070	14	5

for the Year ended 31st December, 1899.

INCOME.

Cr.

	£	s.	d.	£	s.	d.
General Receipts:—						
By Annual Subscriptions less Entrance Fees allowed	1,667	10	0			
„ Interest on Investments, etc.	286	0	10			
				1,953	10	10
Special Receipts:—						
„ Lectures, Sanitary Officers	232	12	0			
„ Examinations	1,523	12	8			
„ Publications—Farr's and Simon's—Profit on Sales	2	2	10			
„ List of Awards to Exhibits	2	11	6			
„ Congress at Southampton	112	14	2			
„ Exhibition „	2,391	8	1			
				4,265	1	3
				6,218	12	1
Balance Excess of Expenditure over Income for the year carried down				331	7	9
				£6,549	19	10
By Balance brought forward from last account (1898)				12,070	14	5
				£12,070	14	5

GENERAL BALANCE SHEET, 31st DECEMBER, 1899.

LIABILITIES.	£	s.	d.
To Fees and Subscriptions paid in advance for 1900	74	6	6
„ Life Composition Fund...	386	8	0
„ Library Catalogue Account	98	2	9
„ Sundry Creditors	972	0	4
Balance of Assets over Liabilities	11,641	16	8
(NOTE.—£5,000 of this balance is to be allotted to Building Fund.)			
	£13,172	14	3

ASSETS.	£	s.	d.	£	s.	d.
By Leases of Premises, Library and Contents of Museum, Furniture and Publications	1,404	16	11			
„ Subscriptions in Arrear and Sundry Debtors	294	17	4			
„ Cash in hand and on Deposit..................	1,768	18	0	3,468	12	3
„ Investments valued at cost—						
£7,658 11 1 2¾% Consols	7,452	15	0			
£1,000 0 0 3°/₀ India Stock	1,095	1	0			
£1,000 0 0 3½% „	1,156	6	0	9,704	2	0
				£13,172	14	3

Examined with the Books and Accounts and found correct,

W. COLLINGRIDGE, M.D.,
LASS, WOOD & DREW, Chartered Accountants, } *Auditors.*

19*th March*, 1900.

ANNUAL DINNER.

H.R.H. The Duke of Cambridge has graciously consented to take the Chair at the Annual Dinner, the date of which has been fixed for Friday, May 11th.

CONGRESS AND EXHIBITION, 1900.

Since the arrangements were made for the Congress and Exhibition, to be held at Nottingham in the Autumn of this year, the large responsibilities which have been placed upon the country in connection with the War in South Africa have made it difficult to assure the success of a Meeting during the present year.

With the approval therefore of H.R.H. The Duke of Cambridge, President, and after consulting with the Authorities at Nottingham, it has been decided to postpone the Meeting to 1901.

CONFERENCE AND EXHIBITION ON THE HOUSING OF THE WORKING CLASSES.

As no Provincial Congress is being held by the Institute, the Council have arranged to hold in the Parkes Museum, in the last week in July, a Conference and Exhibition of the subject of the Housing of the Working Classes. It is proposed to include in the Exhibition, Plans, Photographs, and Models illustrating various descriptions of working class dwellings, common lodging houses, both for urban, suburban, and rural districts, and also models showing the application of building regulations and by-laws.

Papers on the subject will be read and demonstrations will be given. It is also proposed to arrange visits to typical forms of dwellings. Those Members or Associates who are desirous of assisting by the loan of plans or models, or by taking part in the meeting, are requested to communicate as early as possible with the Secretary of the Institute.

Arrangements are also under consideration for holding a meeting in Paris, following this Conference on the Housing of the Working Classes, and immediately preceding the International Congress of Hygiene and Demography, which commences in Paris on August 10th.

Further particulars will be sent to the members as soon as possible.

MEETINGS HELD JANUARY TO MARCH, 1900.

SESSIONAL MEETINGS.

Meetings were held as follows:—On February 14th a Discussion was opened by W. Nisbet Blair, M.Inst.,C.E., on "The Insanitary condition of the London Streets." H. Percy Boulnois, M.Inst.,C.E., in the Chair.

On March 14th, on "Experimental Bacterial Treatment of the London Sewage," by Prof. W. Clowes, D.Sc., F.I.C. Prof. W. Ramsay, Ph.D., D.Sc., LL.D., F.R.S., in the Chair.

On April 4th, on "The Housing of the Working Classes in London in the future," by T. Blashill, F.R.I.B.A. W. Wallace Bruce, L.C.C., in the Chair.

These papers, with the discussions upon them, will be published in Part II. of the Journal.

LECTURES AND DEMONSTRATIONS TO SANITARY OFFICERS

The Twenty-Ninth Course of Lectures and Practical Demonstrations and Visits of Inspection to places illustrative of Sanitary Practice and Administration, was held from January 19th to April 6th, 1900. Twenty-four Students entered their names for the course.

EXAMINATIONS.

From January to March the following Examinations were held:—

PRACTICAL SANITARY SCIENCE.

March 23rd and 24th, Birmingham. 3 Candidates, 1 Certificate granted.

INSPECTORS OF NUISANCES.

January 26th and 27th, Belfast. 7 Candidates, 5 Certificates granted.
March 2nd and 3rd, Exeter. 7 Candidates, 5 Certificates granted.
March 23rd and 24th, Birmingham. 34 Candidates, 19 Certificates granted.

INSPECTORS OF MEAT AND OTHER FOODS.

March 30th and 31st, Birmingham. 5 Candidates, 1 Certificate granted.

Practical Hygiene for School Teachers.

February 9th and 10th, London. 6 Candidates, 3 Certificates granted.

The following lists give the names of the Candidates to whom Certificates were granted :—

Practical Sanitary Science.

1900, Mar. 24.	Camm, Edward.

Inspectors of Nuisances.

1900, Mar. 24.	Asbridge, Isaac.
1900, Mar. 24.	Bennett, Albert Percival.
1900, Mar. 3.	Bevan, Willie.
1900, Mar. 24.	Child, Robert Guy.
1900, Jan. 27.	Dennison, Samuel.
1900, Mar. 24.	Draper, Gideon Henry.
1900, Mar. 3.	Hawkins, John Charles.
1900, Mar. 24.	Hobson, Albert.
1900, Mar. 3.	Jenkins, Henry Llewellyn.
1900, Mar. 24.	Johnson, Thomas Scott.
1900, Mar. 24.	Jones, Frederick William.
1900, Mar. 24.	Judd, Thomas.
1900, Mar. 3.	Kinch, Stanley Asher.
1900, Mar. 24.	Martin, William.
1900, Mar. 3.	Mathews, Edward John.
1900, Mar. 24.	McCartney, John.
1900, Mar. 24.	Negus, Thomas Henry.
1900, Mar. 24.	Nightingale, Henry.
1900, Mar. 24.	*L* O'Connor, Miss Kathleen Scott.
1900, Mar. 24.	Plowright, Joseph Henry.
1900, Mar. 24.	*L* Pountney, Miss Lucy Elizabeth.
1900. Jan. 27.	Reynolds, Henry L.
1900, Jan. 27.	Robinson, William Henry.
1900, Mar. 24.	Simcox, George.
1900, Mar. 3.	Smith, Horace Russell.
1900, Mar. 24.	*L* Stephens, Miss Annie Ethel.
1900, Jan. 27.	Stevenson, William Morton.
1900, Mar. 24.	Watson, William.
1900, Mar. 24.	Williams, John.
1900, Jan. 27.	Wilson, William Wentworth.

Inspectors of Meat and Other Foods.

1900, Mar. 31.	Newby, John.

Practical Hygiene for School Teachers.

1900, Feb. 10. Nicolas, Miss Florence Mary.
1900, Feb. 10. Ravenhill, Miss Alice.
1900, Feb. 10. Richardson, Miss Mona Willingham.

Examination Questions.

Inspector of Nuisances.—Belfast, January 26th and 27th, 1900.

1. What precautions must be taken to prevent contamination of the milk during the act of milking; and, subsequently, whilst the milk is stored in a dairy prior to delivery?

2. What conditions observed in the meat of a carcase of a pig would you consider rendered it unfit for the food of man?

3. Enumerate the diseases required to be notified under the Infectious Diseases Notification Act, 1889. State briefly what points you would note in preparing for the Medical Officer of Health a report on an outbreak of Scarlet Fever in a dwelling house.

4. How are articles of bedding and clothing disinfected? Describe the apparatus employed, and give particulars as to the temperature or steam pressure, and length of exposure necessary for disinfection.

5. Give a brief résumé of Factory and Workshop Legislation, from 1878 to the present time, as far as relates to sanitary conditions.

6. What particulars are required for the registration of a canal boat? Give the details for measurement of cabins.

7. It is necessary to collect samples of river water for analysis; how would you proceed to collect the samples?

8. How should the overflow of a bath be made to communicate with the house drains? Sketch the arrangement of the overflow and waste pipe from end to end.

The Candidates were examined vivâ voce *on the 27th.*

Practical Hygiene for School Teachers. London, Feb. 9th & 10th, 1900

Only twelve questions to be answered. The selection is left to the Candidates, but either Question 1 or Question 2 must be answered.

1. Give a short description of the bones and ligaments forming the spinal column. What is the shape of the spinal column, and how is it affected in childhood by defective attitudes in school work? Give sketches.

2. Give a short description, with sketch, of the cavities of the mouth, nose, throat (fauces), and larynx, considered as air passages. Why are unobstructed nasal passages so essential to the proper growth and health of children?

3. State the number of hours per day that may be healthily devoted to study by children aged 6 to 8, 8 to 12, 12 to 16. Show what breaks or intervals you consider necessary during these hours. What should be the maximum length of a lesson in each case?

4. What is meant by "fresh" foods? Give a list of foods, in the order of their importance, which are valuable as containing the element of "freshness." What diseases are produced in children by dietaries deficient or wanting in fresh foods?

5. Draw a sketch plan showing the general arrangement of a country day school for 250 boys, arranged on one floor. Mark the position of doors, windows, fireplaces, ventilators, lavatories, and cloak rooms. Give the principal dimensions.

6. Describe and sketch the various kinds of windows used in schools. Show the portions which open, and explain how they act. Give a vertical section of an external wall of a class-room to scale of 4 feet to 1 inch, and show position of windows in relation to floor and ceiling.

7. Explain how fresh air can be warmed before admission into a class-room, and how foul air can be removed from the same.

8. Describe a method of warming halls and corridors, either by stoves, hot water, or by hot air.

9. What is the value of exercise in development, and to what particular objects should such exercise be directed in school life? What forms of exercise are in your opinion best adapted to meet these particular objects?

10. What are the respective effects upon young persons of constricting clothes—(*a*) at the neck; (*b*) at the waist; (*c*) about the knee joints.

11. What precautions should be taken to prevent the spread of Scarlet Fever and Measles, prior to receiving definite instructions from a doctor or sanitary officer, in the event of a scholar showing symptons of either of these diseases after the school (day school) has assembled?

12. How may rational education be directed to the following points.

- (*a*) The habit of close observation.
- (*b*) Discrimination of likeness and difference.
- (*c*) The power of correct inferences.
- (*d*) The command of language to formulate correctly and definitely.

13. Explain how the aspect of class-rooms affects the health and comfort of the children. What is the best aspect—and why?

14. What are the constituents of dust as found in school class rooms? How may it be minimised? And what rules should be enforced during school hours to prevent it being disturbed?

15. What are the disadvatages of storage cisterns for water, and how can they be met and remedied?

16. What arrangements in schools would you consider to be good in regard to the following:—

- (1) Lavatories.
- (2) Position and construction of water closets.
- (3) Collection and removal of house refuse.

Illustrate your answer by sketches.

The Candidates were examined vivâ voce *on the* 10*th.*

Inspector of Nuisances.—Exeter, March 2nd and 3rd, 1900.

1. State the circumstances in which premises may be closed:—
   (*a*) Under the Public Health Act, 1875.
   (*b*) Under the Housing of the Working Classes Act, 1890, and amending Acts.

2. What are the nuisances liable to arise from the keeping of pigs? What precautions must be taken by pig-keepers to prevent nuisance? What are the statutory provisions applying to an Urban District?

3. Many carcases of very young calves are imported into this country. Explain the circumstances under which you might seize some of these as unfit for human consumption.

4. What are the powers of Sanitary Authorities with regard to:—
(*a*) Infected persons? (*b*) Infected bedding? (*c*) Infected milk?

5. Distinguish between (*a*) a disinfectant, (*b*) an antiseptic, and (*c*) a deodorant; give examples of each and state how they are employed.

6. What Registers should be kept in the Sanitary Department of an Urban Local Authority, and what facts should be noted in the following Registers:—
   (*a*) Houses let in lodgings? (*b*) Slaughter houses?

7. How may water in a shallow well become polluted? What precautions would you take to prevent pollution?

8. A proposal for the complete redrainage of a mansion of large extent, built many years ago, comes before you. The mansion stands on a hillside, strata all clay, with brook near having a rapid fall. Describe how you would advise dealing with the roof water and water from areas, carriage drives, &c.; and how the sewage proper, *i.e.*, the discharge from w.c.'s, baths, sinks, stables, &c., should be treated, so as to avoid nuisance or the pollution of the stream?

The Candidates were examined vivâ voce *on the 3rd.*

Practical Sanitary Science.—Birmingham, March 23rd & 24th, 1900.

1. What are the laws which connect the volume of a gas with its density and temperature respectively?
What bearing have these laws upon the question of ventilation?

2. Explain the action of the syphon. Illustrate by sketches its application to various sanitary appliances.

3. What precautions should be taken in order to build a healthy house upon—
   (*a*) A clay site?
   (*b*) Sand containing springs?

4. Describe the "Plenum" system of ventilation. What are the advantages and disadvantages of the system as compared with other systems of ventilation?

5. Describe the physical and chemical characteristics of water derived from—
(*a*) A moor.
(*b*) Springs issuing from a chalk formation.
(*c*) A river like the Thames.

6. Describe an artesian well. What are its advantages over other wells? How may the yield of a well be ascertained?

7. Explain what is meant by "combined" and "separate" systems of drainage. What are the disadvantages attending the discharge of rainfall into sewage drains in the case of large premises?

8. How would you test a house drain with a three feet head of water at the upper end of the drain? Explain how the pressure will vary throughout the drain to point of plugging. How would you test a soil pipe which is inside a house?

The Candidates were examined vivâ voce *on the 24th.*

Inspector of Nuisances, Birmingham, March 23rd and 24th, 1900.

1. Give a brief account of the powers a Local Authority possesses to remove a dead body to a mortuary—
(*a*) Under the Public Health Acts;
(*b*) Under the Infectious Disease Prevention Act, 1890.

2. What are the nuisances caused by bone-boiling? How may they best be obviated?

3. In inspecting a slaughterhouse you observe several animals waiting to be slaughtered. What external appearances etc., might lead you to believe that one or more were suffering from advanced tuberculosis?

4. What strength of solution is requisite in using the following disinfectants, viz.:—
(*a*) Perchloride of Mercury;
(*b*) Carbolic Acid;
(*c*) Sulphate of Iron?
For what special purposes are they respectively available, and what are their relative advantages and disadvantages?

5. Give an outline of the routine daily work of a Sanitary Inspector for a small Urban or a small Rural District.

6. How wonld you avoid the pollution of a pure supply of water to a house where a cistern is the only means of storage?

7. What do you understand by the terms Natural and Artificial Ventilation? Give four examples of artificial ventilation, and state under what conditions each system you mention might with advantage be adopted.

8. In one house of a continuous terrace, with gardens and areas in front, and yards and outbuildings at back, a foul smell is complained of, and the drains passing the house are suspected, How would you set about to prove the soundness or otherwise of the drains? and if found unsound, describe your procedure up to the completion of the construction of a new drain.

The Candidates were examined vivâ voce *on the 24th.*

Inspectors of Meat and other Foods.—Birmingham, March 30th and 31st, 1900.

Paper I.

1. What regulations apply to the sale of milk from cows suffering from:—

Pleuro-Pneumonia.
Foot and mouth disease.
Anthrax.
Tuberculosis.

Name the Acts and Orders under which action could be taken.

2. What symptoms would be shown by a living ox suffering from a contagious febrile disease? Would the thermometer give any assistance, and how would you use it?

3. From what diseases do poultry suffer? State how you would examine the carcase of a fowl, and what organs would specially claim your attention.

4. What glands in a carcase would you specially examine in order to ascertain whether an animal was diseased or otherwise? Contrast a healthy lymphatic gland with one affected with tuberculosis.

5. What are the distinguishing appearances of the carcases of the following animals:—

Ox and heifer.
Bull and cow.
Sheep and goat.
Ewe and wether.

Paper II.

6. What are the characteristics of horse-flesh and how would you distinguish it from ox-beef? Under what conditions can horse-flesh be sold for human food?

7. Describe the appearance of the fat of the horse and sheep.

8. Give a description of what you consider a model slaughter-house, the number of compartments you consider necessary, and the purposes for which each should be used, and accompany your answer by a sketch.

9. What methods of stunning animals are adopted? How do they act and what difference in their effects do you recognize?

10. What is the effect of salting meat and what are the specific dangers to be guarded against? How would you examine salt meat so as to ascertain its fitness for food.

The Candidates were examined vivâ voce *on the* 31*st.*

FORTHCOMING MEETINGS.

CALENDAR, APRIL TO JULY, 1900.

As far as at present arranged.

Council Meetings are held Monthly on the Second Wednesday in each Month at 5 p.m., except August and September.*

Special Purposes Committee	Third Monday at 5 p.m.
Finance Committee	Second Wednesday at 4.30 p.m.
Exhibition Committee	First Monday at 5 p.m.
Congress and Editing Committee	Second Monday at 5 p.m.
Museum and Library Committee	Fourth Monday at 5 p.m. (except December).
Examination Committee	Fourth Friday in April, 6 p.m.
Parliamentary Committee	As occasion requires.
Rivers Pollution Committee	
Meat Inspectors Exam. Committee	

APRIL.

4 W. **Sessional Meeting.**
27 F. }
28 S. } Examinations in Practical Sanitary Science and for Inspectors of Nuisances, London.

MAY.

4 F. }
5 S. } Examination for Inspectors of Meat and other Foods, London.
11 F. Dinner of the Institute at the Holborn Restaurant, at 7 p.m. H.R.H. The Duke of Cambridge, President, has consented to take the Chair.

JUNE.

8 F. }
9 S. } Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Edinburgh.
22 F. }
23 S. } Examinations in Practical Sanitary Science and for Inspectors of Nuisances, and in Practical Hygiene for School Teachers, Leeds.

JULY.

6 F. }
7 S. } Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Cardiff.
20 F. }
21 S. } Examination in Practical Sanitary Science and for Inspectors of Nuisances, Liverpool.
27 F. }
28 S. } Examination for Inspectors of Meat and other Foods, Liverpool.
Conference and Exhibition on the Housing of the Working Classes.

FELLOWS, MEMBERS AND ASSOCIATES ELECTED.

From January to April, inclusive.

(A complete list can be had on application.)

FELLOWS.

1900. Apr. Barrington, Sir Vincent Hunter B. Kennett, M.A., 65, *Albert Hall Mansions, Kensington Gore, W.*

1900. Mar. Chadwick, Osbert, C.M.G., M.INST.C.E., 11, *Airlie Gardens, Campden Hill, W.*

1900. Feb. Childs, Christopher, M.A., M.D., M.R.C.S., D.P.H., F.C.S., 10, *Manchester Square, W.*

1900. Mar. Deacon, George Frederick, M.INST.C.E., M.INST.M.E., F.R.MET.SOC., 19, *Warwick Square, S.W.*

1900. Jan. Dhurandhar, Rao Bahadur Krishnarno Vishwanath, *Medical Officer and Sanitary Commissioner, Baroda, Bombay Presidency, India.*

1900. Apr. Galton, Francis, F.R.S., 42, *Rutland Gate, S.W.*

1900. Apr. Kaye, James Robert, M.B., C.M., D.P.H., F.C.S., *Medical Officer of Health, West Riding, Yorks, Wentworth Lodge, Wakefield.*

1900. Apr. Niven, James, M.A., M.B., M.O.H., *Health Department, Town Hall, Manchester.*

1900. Apr. Pakes, Walter Charles Cross, L.R.C.P., M.R.C.S., D.P.H., F.C.S., 14, *Trinity Square, S.E.*

MEMBERS.

* Passed the Examination of the Institute in Practical Sanitary Science.
‡ Passed Examination for Inspector of Nuisances.
† Passed Examination for Sanitary Inspector.

1379 1900. Mar. ‡Bush, Walter Ernest, *City Surveyor's Office, Birmingham.*

1373 1900. Jan. Cochrane, Miss Constance, *The Downs, St. Neots.*

1387 1900. Apr. Cowburn, Arthur Douglas, D.P.H., M.D., M.R.C.S., L.R.C.P., 31, *Barkston Gardens, S. Kensington.*

1380 1900. Mar. Currall, Albert Edward, *Surveyor Rural District Council, Solihull, Warwick.*

1374 1900. Jan. Davidson, James Fleming, *Willington Quay, Northumberland.*

1375 1900. Jan. Hill, G. Everett, 874, *The Broadway, New York.*

1376 1900. Jan. Hair, C. J., A.R.I.B.A., 28, *Bugle St., Southampton.*

1381 1900. Mar. Jackson, W. M. M., M.D., L.R.C.S., L.R.C.P.EDIN., 171, *Shooter's Hill Road, Blackheath, S.E.*

1382 1900. Mar. ‡Kirton, Martin, L.R.C.P.LOND., M.R.C.S., D.P.H.LOND., 2, *Outram Terrace, Devonport.*

1388 1900. Apr. Lacey, George William, *Borough Surveyor, Oswestry.*

1383 1900. Mar. Nesbit, David Mein, 12, *Gt. James Street, Bedford Row, W.C.*

1389 1900. Apr. Nicolas, Florence Mary, "*Athlone,*" *Grove Park Road, Eltham, S.E.*

1384 1900. Mar. Norton, Harry Barker, *Calcutta, India.* (*Sanitary Engineer to the Viceroy and Governor of India.*)

1390 1900. Apr. *Overbury, Thomas, 6, *Well Walk, Clarence Street, Cheltenham.*

1385 1900. Mar. Pegge, John T., *Assistant Engineer and Surveyor, Guildhall, York.*

1391 1900. Apr. ‡Rayner, Frederick John, *Ibis Villa, Fort Road, Newhaven.*

1377 1900. Jan. ‡Ross, Douglas, *Church House, Brede, Sussex.*

1392 1900. Apr. Shaw, Herbert, ASSOC. M. INST. C. E., *Engineer and Surveyor, Urban District Council, Ilford, E.*

1386 1900. Mar. *Sutcliffe, James Henry, *Hazlewood, Hebden Bridge.*

1378 1900. Feb. ‡Taylor, Albert, 7, *Commercial Road, Pimlico, S.W.*

ASSOCIATES.

‡ Passed Examination for Inspectors of Nuisances.

2047 1900. Jan. ‡Atkinson, T. R., *Graham St., Penrith, Cumberland.*

2061 1900. Feb. ‡Attenborough, Henry, 2, *Northgate View, Hessle, E. Yorks.*

2082 1900. Mar. ‡Auger, Walter George, 41, *Lawford Road, Kentish Town, N.W.*

2107 1900. Apr. ‡Bennett, John Charles, *Walton, near Wakefield.*

2045 1900. Jan. ‡Bentham, Miss Evelyn May, 2, *Fairfield Road, Old Charlton, S.E.*

2083 1900. Mar. ‡Blizard, Edward Ernest, 5, *Cumberland Terrace, Derby Road, North End, Portsmouth.*

2084 1900. Mar. ‡Bonnett, Isaac, 31, *Belmont Rise, Maidenhead.*

2063 1900. Feb. ‡Brown, Arthur George Gray, 29, *Quarry Road, Tunbridge Wells.*

2085 1900. Mar. ‡Burton, Thomas, 6, *Park Terrace, Keighley.*

2062 1900. Feb. ‡Butterell, Arthur, 43, *Almond Bank Terrace, N. Merchiston, Edinburgh.*

2086 1900. Mar. ‡Carter, Arthur Herbert, 44, *Heathfield Road, King's Heath, Birmingham.*

2087 1900. Mar. ‡Coulson, John H. P., 77, *Oak Street, Norwich.*

2088 1900. Mar. ‡Crisp, Henry Robert, 6, *Church Street, Ealing, W.*

2049 1900. Jan. ‡Edmed, G. H., *West Malling, Maidstone.*

2108 1900. Apr. ‡Edser, William, *Surveyor's Office, Tindall Square, Chelmsford.*

2089 1900. Mar. ‡Fryer, Stephen S. P., 28, *Elphinstone Rd., Hastings.*

2090 1900. Mar. ‡Gibbons, James Thomas, 66, *Penton Place, Kennington, S.E.*

2064 1900. Feb. ‡Goodall, Horatio Charles, *Tyne House, St. Catherine's, Lincoln.*

2065 1900. Feb. ‡Goodman, James, 24, *Government Row, Enfield Lock. N.*

2091 1900. Mar. ‡Gregory, Edward George, 56, *St. John's Road, Upper Holloway, N.*

2092 1900. Mar. ‡Griffith, William Owen, 17, *Glanhwfa Road, Llangefui.*

2093 1900. Mar. ‡Herringshaw, Alfred, *Chester Road, Macclesfield.*

2109 1900. Apr. ‡Hill, Charles, *Municipal Buildings, Shanghai.*

2066 1900. Feb. ‡Holmes, Miss Rose Beatrice Wyman, 4, *Croftdown Road, Highgate Road, N.W.*

2094 1900. Mar. Honey, Miss Emma Constance, *The Lodge Hotel, Reading.*

2067 1900. Feb. ‡Hope, Clement, 13, *Braithwaite Street, Blackpool.*

2095 1900. Mar. ‡Hosier, Frederick George, *Kingston Villas, Judd Street, Tonbridge.*

2096 1900. Mar. ‡Jones, David James, 12, *Alma Street, Tynewydd, Treherbert, Glam.*

2068 1900. Feb. ‡Jones, George Arthur, *18, Edwin Street, Gravesend.*

2097 1900. Mar. ‡King, Peter, *Station Road, Mirfield, Yorks.*

2069 1900. Feb. ‡Le Lean, Miss Mary Kate, 11, *St. Lawrence Road, Plymouth.*

2098 1900. Mar. ‡Liddle, Jonas, *Cabin Gate, Bishop Auckland.*

2110 1900. Apr. ‡Livesay, Henry, 19, *Euston Street, Preston.*

2050 1900. Jan. ‡Lockton, H. W., 6, *Lonbard Street, Newark, Trent.*

2111 1900. Apr. ‡Marshall, Rodger Wilson, 193, *Regent Road, Fenton, Staffs.*

2051 1900. Jan. ‡Martin, Warwick Hammond, 3, *Corporation Buildings, Seaton, Delaval, Northumberland.*

2099 1900. Mar. McAra, Robert Blair, *Sanitary Department, Town Hall, Leeds.*

2100 1900. Mar. ‡Mulcahy, Miss Ellen Ellie, 31, *Catherine Street, Liverpool.*

2070 1900. Feb. ‡Nicholson, Bernard Lee, *St. Miles' Bridge, Norwich.*

2052 1900. Jan. ‡Orme, Miss Brenda Temple, 213, *Uxbridge Road, Shepherd's Bush, W.*

2101 1900. Mar. ‡Pearson, Edward Mazzini, 12, *Claremont Road, Irlams-o'-th'-Heights.*

2071 1900. Feb. ‡Pike, William E., 103, *Shirland Rd,. Paddington, W.*

2072 1900. Feb. ‡Plowman, Vernon Attril, 41, *Lorne Road, Stroud Green, N.*

2057 1900. Jan. ‡Ramsbottom, Thomas, *County Asylum, Durham.*

2053 1900. Jan. ‡Ramsden, Fred. St. Bede, 25, *Athenæum Street, Plymouth.*

2054 1900. Jan. ‡Richardson, Arthur George, 2, *Leamington Avenue, Hoe Street, Walthamstow.*

2073 1900. Feb. ‡Richardson, Miss Mona Willingham, 9, *Cranbourne Court, Albert Bridge Road, S.W,*

2112 1900. Apr. ‡Robinson, William Henry, 7, *Cheviot Street, Strandtown, Belfast.*
2074 1900. Feb. ‡Sendell, Frank Guy, 56, *Aldworth Road, West Ham, E.*
2075 1900. Feb. ‡Slaughter, Leonard, *Headley, Hamilton Road, Southville, Bristol.*
2076 1900. Feb. ‡Smedley, John Henry Moore, 141, *Bedford Road, Rock Ferry.*
2102 1900. Mar. ‡Stuart, Miss Marie, 81, *St. Helen's Gardens, North Kensington, W.*
2055 1900. Jan. ‡Stuart, Robert Grant, 30, *Despard Rd., Highgate Hill, London, N.*
2056 1900. Jan. ‡Sturdy, Thomas Watson, 1, *Third Street, Wallsend-on-Tyne.*
2113 1900. Apr. ‡Tattersall, Miss Alice, 134, *Malmesbury Road, Bow, E.*
2103 1900. Mar. ‡Thatcher, A. G. H., 6, *Churchill Road, Willesden Green, N.W.*
2077 1900. Feb. ‡Tweed, Charles Casburn, 61, *Caistor Park Road, West Ham, E.*
2058 1900. Jan. ‡Wallin, William, 17, *Alexander Terrace, Newcastle-on-Tyne.*
2078 1900. Feb. ‡Warren, Andrew, *Surveyor, Buckfastleigh, Devon.*
2106 1900. Mar. ‡Warwick, Wm., A., 4, *Lone Street, Birkenhead.*
2079 1900. Feb. ‡White, Arthur David, 79, *Albany Street, N.W.*
2105 1900. Mar. ‡White, Ellis Foulkes, *Treanedd, Segontium Road, S. Carnarvon.*
2059 1900. Jan. ‡Wilkie, Robert Edwin, 55, *The Grove, Hammersmith, W.*
2060 1900. Jan. ‡Witten, Charlton Potts, 13, *Elwin Terrace, Sunderland, Durham.*
2114 1900. Apr. ‡Wood, James William, 44, *Carleton Street, Nelson.*
2104 1900. Mar. ‡Woodley, Ben. Thorne, *Doncaster.*
2080 1900. Feb. ‡Youd, Thomas, *Huxley, near Chester.*

OBITUARY.

GEORGE JAMES SYMONS, F.R.S.

(FELLOW).

It may well be said that the passing "within the veil" of Mr. G. J. Symons is a national loss, and the removal of a well esteemed colleague from the ranks of the Fellows of The Sanitary Institute a deeply felt sorrow.

His active and useful life came to a close after an illness of three weeks—following a stroke of paralysis, from which he never rallied—on Saturday afternoon, 10th March, 1900, in his sixty-second year, at his residence, 62, Camden Square, and his remains were buried on the 16th March in Kensal Green Cemetery, after a memorial service at Holy Trinity Church, Marylebone Road, at noon. This was numerously attended, and among the many distinguished men present were Lord Lister, the President of the Royal Society, and Sir Michael Foster, the Secretary.

The Rector of Holy Trinity, The Rev. E. Grose Hodge, in a short address, drew attention to the fact that Mr. Symons' life was one more witness to the truth that there need be no personal severance of science and religion, and while prominent in scientific circles, he was well known for his constant attendance in church, and for his faith.

Mr. Symons was a Londoner, born on 6th of August, 1838, the only child of Mr. Joseph Symons of Pimlico, and was educated at St. Peter's Collegiate School, Eaton Square.

He exhibited a love of natural science very early in life, and despite advice given him by Mr. James Glashier, the founder of the Meteorological Society, that scientific investigations were not profitable, he stuck to his fixed idea, and at eighteen joined that Society, and a year after became a meteorological reporter of the Registrar-General. In 1857 he originated an organization for observing and recording thunderstorms.

He was, for some years, an assistant of the late Admiral Fitzroy at the Board of Trade. The work was not congenial to him, and having formed the idea that a study of the rainfall

Photo by Ruddock, Newcastle-upon-Tyne.

G. J. Symons

offered an opening, he began the work for which his life was famous, and in 1860 he published the first volume of "British Rainfall," and continued the publication annually until 1898—this, the last volume published by him, contained records from 3,404 stations in the United Kingdom.

In 1866 he first published the "Meteorological Magazine," and the number for March, 1900, is the first which contains no article by him. Some indication of the work of his life is given in an article therein by Mr. H. Sowerby Wallis, F.R.Met.Soc., who, at Mr. Symons' request, will carry on his important work. We find that for forty-four years he was a Fellow of the Meteorological Society, for twenty-seven years its Honorary Secretary, for three years its President, and had been elected to the chair this year as being best fitted to the post at the celebration of its Jubilee. He furnished monthly records of meteorological observations to the Registrar-General for forty-two years, for forty years he was a member of the General Committee of the British Association, he was a Member of the Scottish Meteorological Society for nearly forty years, and for twenty-seven years a Member of the Société Météorologique de France, and served three times on the Council.

Mr. Symons was for some years a member of the Council of the Royal Botanic Society, he was among the first members of the Sanitary Institute on its formation, he became Member of Council in 1879 and Registrar in 1880. These offices he held until 1895, when he resigned.

He will ever be remembered for the great assistance he gave to the Institute; his interest in its doings continued to the end, he was at our last Congress in Southampton, and gave a lecture to the Students of the Institute in November.

Mr. Symons never received any honour from the State. He was awarded the Albert Medal by the Society of Arts in 1897 "for services he rendered to the United Kingdom by affording to engineers engaged in the water supply and the sewage of towns a trustworthy basis for their work by establishing and carrying on during nearly forty years systematic observations (now at over 3,000 stations) of the rainfall of the British Isles, and by recording, tabulating, and graphically indicating the results of these observations in the annual volumes published by himself."

The way these observations were appreciated is shown by the constant association of Mr. Symons with almost every water and sewage project from the 1st Report of the Rivers Pollution Commission, 29th March, 1866, to the present year, and he was a well known figure in the Committee Rooms of both Houses of Parliament.

The Institution of Civil Engineers awarded him a Telford Premium in 1876.

The Royal Society elected him to a Fellowship in 1878.

He was created a Chevalier de la Légion d'Honneur in 1891.

Mr. Symons was a widower, having lost his wife nearly fifteen years ago; he was wedded to his work, few know how hard he did work; from early morn till late at night he might be found among his loved books and his figures, and to accurately compile such detail was not an easy task, ably assisted as he was for nearly thirty years by Mr. H. Sowerby Wallis, and for some six or seven years by his brother, Mr. E. White Wallis—the valued Secretary of our Institute.

Mr. Symons was modest and reticent, almost to a fault, ever genial, ever kind, ever ready to help in perfecting the great work of his life, for the whole cost of the organization which he originated he was personally responsible, and he visited in person most of his stations which had developed under his care from a little band of 168 voluntary observers, in 1860, to the strength of more than 3,000 at the present day.

In closing this too brief memoir of a remarkable man, one has the happy reflection that in his life there was "something attempted, something DONE."

L. F.

ROGERS FIELD, B.A., M.INST.,C.E.

(VICE-PRESIDENT).

MR. ROGERS FIELD, B.A., London, M.Inst.,C.E., the distinguished hydraulic and drainage engineer, who died at his residence, Squires Mount, Hampstead, on March 28th, last, was born in 1831. Mr. Field was named after his mother's uncle, Samuel Rogers the poet. On his father's side Mr. Rogers Field was descended from Henry Cromwell, his great grandfather, the founder of the old Annuity Society of London, having married Henry Cromwell's great grand-daughter, Anne. His father was the well known solicitor, Mr. Edwin Wilkins Field, whose statue is a prominent object in the hall of the Law Courts. Mr. Rogers Field was his eldest son, and never married. He was articled to Mr. Thomas Wicksteed, the eminent water engineer, and commenced practice some thirty years ago.

He was the inventor of Field's engineering aneroid barometer, the special feature of which is an adjustment for variation in temperature, enabling altitudes to be correctly ascertained in an extremely simple manner. But he devoted himself more especially to engineering works connected with sanitation, and designed and superintended the construction of the drainage and water supply arrangements of a great number of public institutions and private buildings in all parts of the country, including the drainage of Sandringham House and Bagshot Park. The By-Laws and Regulations he framed in 1876 for the town of Uppingham were substantially adopted by the Local Government Board in 1877, in their model By-laws as to house drainage. The automatic flushing tanks and siphons which he brought, after many laborious experiments, to a high degree of perfection, are largely used in drainage and sewerage works, both in this country and in America.

Mr. Field was connected with The Sanitary Institute from its commencement twenty-four years ago, and was one of its most devoted supporters. He was an active member of its Council and various committees, where his careful investigation of matters under consideration was of great value to the Institute, and he represented the Institute on many official deputations.

Mr. Field was elected a Vice-President early in the present year, in recognition of the many services he had rendered to the Institute.

In matters connected with the Exhibitions of the Institute and the Parkes Museum, he was specially prominent; he introduced thoroughly practical methods of judging at the Exhibitions, and gave a large amount of time to investigating and testing the various exhibits.

When the Parkes Museum was arranged in its present premises, he designed, in conjunction with Prof. Corfield, the whole of the drainage arrangements, supervised their carrying out, and personally bore the whole of the expense.

The rearrangements of the Museum, with the preparation and publication of a catalogue in 1891, were provided for by a donation from Mr. Field of £250, and on other occasions his generosity has frequently assisted the work of the Institute.

For nearly twenty years he was engaged in conjunction with the late Sir Douglas Galton, Mr. W. Eassie, and Mr. Wallace Peggs, in carrying out an exhaustive series of experiments in air meters, cowls, and terminals. The burden of the work and also a very considerable portion of the expenditure, amounting to upwards of £1,000, was borne by Mr. Rogers Field, and it is much to be regretted that he was unable to complete the report upon this elaborate work.

It was, however, in an advanced stage at the time of his death, and the Council hope that they may be able to bring it to completion and issue the report on the lines already laid down by Mr. Field and the Committee.

Mr. Rogers Field had so closely associated himself with every detail in the working of the Institute that his loss will long be felt among the Council and those with whom he worked. His remains were interred at Highgate Cemetery on March 31st.

W. H. C.

EXHIBITS ADDED TO THE MUSEUM,

JANUARY TO MARCH, 1900.

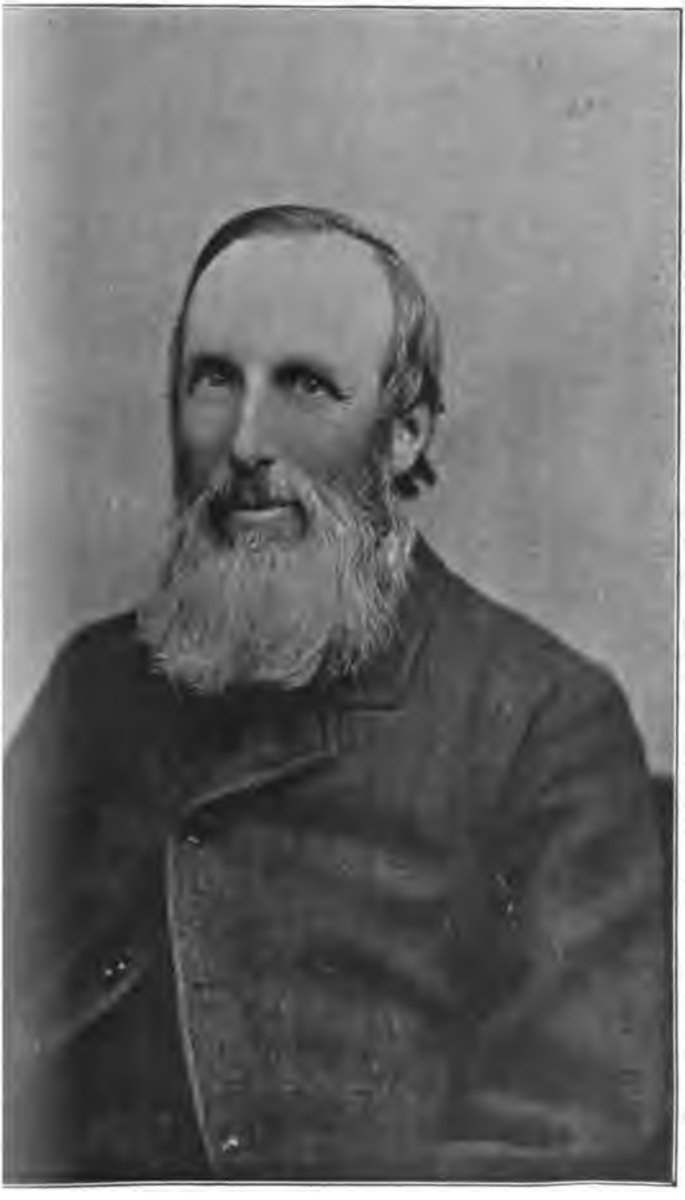
Rainfall Map of British Isles, being an enlarged copy of Mr. Symons' map from the Journal of the Sanitary Institute.

Flushing Cisterns. "The Niagara," in mahogany case with glass front to show internal fittings. *Claughton Bros.*

Roof-washing Tank. "Roberts' Patent," for obtaining clean water from the roofs of cottages and other buildings that are too small for the more expensive "Separator." *C. G. Roberts.*

Tank lined with Bituminous material, to illustrate the application of same to reservoirs and impervious tanks. *Callender & Co.*

Old Trap, designed to act for two closets. *James Cave*



uds, London.

Roger Field

IBUTIONS AND ADDITIONS TO LIBRARY

January to March, 1900.

or publications of Societies and Institutions, &c., see under "Academies."

ACADEMIES (British).

ssociation for the Advancement of Science. Report of
ty-ninth Meeting, held at Dover, September, 1899. 1071
o. London, 1900. *The Association.*

University College of South Wales and Monmouthshire.
ar, 17th Session, 1899–1900. *The Registrar.*

Royal College of Surgeons of England. Calendar, 1899.
., 8vo. London, 1899. *The College.*

St. Thomas' Hospital. Reports, New Series, Vol. XXVII.,
483 pp., 8vo. London, 1899. *The Secretary.*

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ert E., F.I.C., F.C.S. The Pasteurisation and Sterilisation
k. 41 pp., 16mo. London, 1899.
Rebman, Ltd. (publishers).

., J.P., F.R.C.S.I., D.P.H. Reprints on the Control of
ious Diseases, with especial reference to Measles and Whoop-
ugh. 14 pp., 8vo. Wigan. *The Author.*

urg.-Major W. G., M.R.C.S. Notes on Typhoid and Re-
t Fevers in the Cape, Natal, and Zululia. 11 pp., 8vo.
t, *Medical Times & Gazette*, Nov. 15th, 1879. *The Author.*

f Agriculture. The Pear and Cherry Saw-Fly (Leaflet No.
4 pp., 8vo. London, 1900. *The Board.*

Prof. Frank, D.Sc., F.I.C., and **Houston,** *A. C., M.B., D.Sc.*
rial Treatment of Crude Sewage (Supplement to Second
t): Notes on the deposit which accumulates on the coke
ents of the coke beds at Barking and Crossness. (L.C.C.
t.) 6 pp., fcap. London, 1899. *Prof. Frank Clowes.*

eorge B., and **Dye,** *Frederick.* A Complete and Practical
e upon Plumbing and Sanitation, embracing Drainage and
bing practice, both perfect and defective; Sanitary Appli-
; the Erection of Public Conveniences; the Sanitation of a
ry House, including Water Supply and Sewage Disposal;
stic Hot Water Supply; Warming buildings by Hot Water,
, and Heated Air; Horticultural Heating Works; Steam
ng Apparatus; Gas; Electric Light; Bell's. 674 pp., 4to.
on, 1898. *G. B. Davis.*

Derbyshire, C.C. Report upon the Water Supplies of Derbyshire, by Sidney Barwise, M.D., and John Somes Story, M.Inst.C.E. 47 pp., fcap. Derby, 1899. *S. Barwise, M.D.*

Education Department. Special Reports on Educational Subjects, 1896-7. 732 pp., 8vo. London, 1897. *Purchased.*

Gay, *John, M.R.C.S., D.P.H.* Disinfection and Disinfectants. 15 pp., 16mo. London, 1900. *The Author.*

Hamburgh. Bericht des Medicinalrathes über die Medicinische Statistik des Hamburgischen Staates für das Jahr 1898. 104 pp., 4to. *Prof. W. H. Corfield, M.A., M.D.Oxon.*

Hill, *T. Eustace, M.D.* Consumption: Its Propagation and Prevention. 12 pp., 8vo. Newcastle, 1899. *The Author.*

Home Office. Annual Report of the Chief Inspector of Factories and Workshops for the Year 1898. Part I., Tables; Part II., Reports. 382 pp., fcap. London, 1899.
Arthur Whitelegge, M.D., H. M. Chief Inspector.

Jensen, *Gerard J. G.* House Drainage and Sanitary Fitments. 262 pp., 8vo. London, 1900.
The Sanitary Publishing Co.

Karkeek, *P. Q., M.R.C.S.* Notes on Torquay as a Health Resort. 8 pp., 8vo. Torquay. *The Author.*

Leipzig. Dreissigster Jahresbericht des Landes-Medicinal-Collegiums über das Medicinalwesen im Königreiche Sachsen auf das Jahr 1898. 392 pp., 4to. Leipzig, 1899.
Das Landes-Medicinal-Collegiums.

Local Government Board. Extract from the Annual Report of 1898—99 Sale of Food and Drugs Act. 27 pp., 8vo. London, 1899. *Prof. W. H. Corfield, M.A., M.D.Oxon.*

——— Dr. G. S. Buchanan's Report upon Epidemic Enteric Fever in the Borough of Falmouth. 24 pp., fcp. London, 1900.
W. H. Power, F.R.S.

——— Dr. L. W. Darra Mair's Report upon the Sanitary circumstances and administration of the Urban Districts of Bilston and Coseley, and upon a prevalence of Enteric Fever therein. 27 pp., fcp. London, 1900. *W. H. Power, F.R.S.*

——— Dr. F. St. George Mivart's Report on the General Sanitary Circumstances and Administration of the Biggleswade Rural District, and on the Prevalence of Diphtheria and Enteric Fever therein. 29 pp., fcp. London, 1899.
Sir Richard Thorne Thorne, K.C.B., F.R.S.

Manby, *E. Petronell, M.D., D.P.H.* Meat Inspection and the Abolition of Private Slaughter-houses. 8 pp., 8vo. Reprint from *British Medical Journal,* September 2nd, 1899. *The Author.*

Manchester Sewage. Expert's Report (with Diagrams). 8vo. Manchester, October, 1899.
Baldwin Latham, M.Inst.C.E.

f. Wm. P. Water Supply (considered principally from y standpoint). 504 pp., 8vo. New York and London, *The Author.*

.mination of Water (Chemical and Bacteriological). 135 New York and London, 1899. *The Author.*

tts State Board of Health. Thirteenth Annual Report. ³vo. Boston, 1899. *The Board.*

n C., M.D., F.R.S.E. Municipal Duty as to the Pre- ›f Tuberculosis. 16 pp., 8vo. Reprint from *Sanitary* Nov., 1899. *The Author.*

ꓛAL OFFICERS OF HEALTH AND OTHER SANITARY REPORTS.

).C., 1899 ..	*G. B. Wray, M.R.C.S., D.P.H.*
.. .. ..	*W. H. Symons, M.D.*
ʿ.C., 1899 ..	*J. W. Burdwood, M.O.H.*
D.C & Knutsford, ch, Winsford, and U.D.C.'s, 1899 ..	*T. W. H. Garstang, M.R.C.S., D.P.H.*
(Rural), 1899 ..	*John C. Thresh, D.Sc., M.D., D.P.H.*
., 1899	*J. H. Garrett, M.D, D.P.H.*
l899	*S. T. Taylor, M.B.*
1899	*Prof. A. Bostock Hill, M.D., D.P.H.*
1899	*James Rawlings, M.O.H.*
(San. Insp.), 1899	*J. Charlton.*
ter, 1899 ..	*D. Corbet, M.O.H.*
., 1898	*Shirley F. Murphy, M.R.C.S.*
ral), 1899 ..	*John C. Thresh, D.Sc., M.D., D.P.H.*
1899	*J. Richmond, M.B., D.P.H.*
et and St. John, ster, 1899 ..	*J. Norton, M.D., D.P.H.*
w, Bethnal Green p.), 1899.. ..	*J. Foot, Sanitary Inspector.*
' **R.D.C.**, 1899 ..	*M. Farrant, L.R.C.P.*
lfield, 1899 ..	*Prof. A. Bostock Hill, M.D., D.P.H.*
399	*P. Q. Karkeek, M.R.C.S,*
Wells, 1899 ..	*W. Stamford, L.R.C.P.*
ıshire R.D.C. ..	*G. E. Schoefield, M.D., D.P.H.*
ıl, 1899	*J. Loane, M.R.C.P., D.P.H.*
9	*W. Berry, F.R.C.S.I., D.P.H.*
, 1899	*E. Pocklington, M.O.H.*

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ssociation for Prevention of Consumption. Report of cil, 1899. 15 pp., 8vo. London, 1900. *The Association.*

New South Wales. Report on Leprosy in, for the year 1898. 14 pp., fcp. Sydney, 1899. *J. Ashburton Thompson, M.D.*

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ON LEGISLATION AND LAW CASES.

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porated Council of Law Reporting for England and Wales.
xt of these see Law Reports, which can be referred to in the
f the Institute.**

HOUSE.—*Common Lodging House—Liability to Penalty
ing—Charitable Institution—Non-Registration—Common
Houses Act, 1851 (14 & 15 Vict., c. 28)—Common
Houses Act, 1853 (16 & 17 Vict., c. 41).*

the Common Lodging Houses Act, 1853, provides that
hall not keep a common lodging house unless his name
er thereof be entered in the register kept under the
dging Houses Act, 1851."
ondent kept a house for the reception of male lodgers,
ot carried on for the sake of making a profit, but solely
pose of assisting the poorer classes. The lodgers were
or 8d. a night, and for this each lodger got the use of a
ing-hall and sitting-room, and the right to the exclusive
of a cubicle which contained a bed, and which was sepa-
the rest of the dormitory by walls six and a half feet high
es. A certain number of the lodgers were of a better
he inhabitants of an ordinary common lodging house, but
y the lodgers were of that description. Drunken and
en, and men who were suspected of being criminals or
were not admitted, but all other men were admitted on
The house was not registered as a common lodging house.
at since the inmates of the house were persons of the

poorer class, who were likely to be in a dirty and insanitary condition, and since they occupied at least part of the house in common, it was a common lodging house within the meaning of the Common Lodging Houses Acts, 1851 and 1853, and ought to have been registered.—(LOGSDON *v.* TROTTER.) Div. Ct., 1 Q. B. [1900], 617.

SEWER.—*Vesting in Local Authority—"Sewers made by any person for his own profit"—Public Health Act, 1875 (38 & 39 Vict., c. 55, s. 13, sub.-s. 1).*

A drain was made by the owner of a quarry for the purpose of collecting and carrying off surface water coming on to his land and preventing it from running over the quarry. By means of the drain the quarry could be more economically and conveniently worked than if the water were allowed to spread over it.

Held, that the drain was a sewer, made by a person for his own profit, within the meaning of s. 13, sub-s. 1, of the Public Health Act, 1875, and did not vest in the local authority of the district.—Decision of the Queen's Bench Division [1899], 1 Q. B. 979, reversed. *Croysdale v. Sunbury-on-Thames Urban Council [1898] 2 Ch. 515, approved.*

SYKES *v.* SOWERBY URBAN DISTRICT COUNCIL, Court of Appeal, 584 [1900] W. N. 49 [1900] 1 Q. B., 584.

NUISANCE.—*Conditions of Sale—"Outgoings"—Notice by Sanitary Authority to abate Nuisance.*

Conditions of sale of leasehold houses provided that the purchase should be completed on August 11th, 1898, and that "a purchaser paying his purchase-money is, as from that day, to be let into possession or receipt of rents and profits; and up to that date all rents, rates and taxes, and outgoings are (if necessary) to be apportioned, and each apportioned rent shall be paid on completion by each purchaser to the vendor. If from any cause whatever, other than wilful default on the part of the vendor, the completion of the purchase is delayed beyond the before-mentioned day, the remainder of the purchase-money is to bear interest at the rate of £6 per cent. per annum from that day to the day of actual payment thereof, or, at the option of the vendor, he may receive the rents and profits up to the day of the actual completion of the purchase. The property shall, as from the day of sale, be at the sole risk of the purchaser, and the vendor shall not incur any liability by reason of its then or subsequently becoming or remaining untenanted, uninsured, or deteriorated." Through default of the plaintiff, who had purchased one of the lots, his purchase was not completed on August 11th, although the title had then been accepted, and the defendant, the vendor, remained in possession. In November 1898, notices were served on the defendant as "owner" by the Vestry, under the Public Health (London) Act, 1891 (54 & 55 Vict., c. 76), to abate nuisances on the property, and the cost of making the abatement, about £24, was paid by the defendant. In February, 1899, the plaintiff was ready to

d offered to pay interest at six per cent. on the balance
ıase-money from August 11th, on receiving the rents
'rom that date, and in that case to repay the £24; but
that if the defendant retained the rents and profits he
r the cost of the abatement.

t the £24 being an outgoing (Tubbs v. Wynne [1897]
which, from the time when a good title was shown, must
ɔrne by the purchaser in the absence of express stipula-
ıintiff would as from August 11th have been entitled to
d profits and liable to pay the £24, if the conditions had
e vendor the option to keep the rents and profits in lieu
ɔut that there was nothing to relieve the plaintiff of the
pay the outgoings, and that he could only obtain specific
on paying the £24 and the balance of his purchase
ᴀʀsʜᴛ *v.* Tᴀɢɢ. Justice J. Cozens Hardy, 1 Ch. [1900],

VERNMENT.—*By-Laws—Buildings—Water Tower—*
'Public Health Acts on subsequent special Water Companies
Vaterworks Clauses Act, 1847 (10 & 11 Vict. c. 17), s.
blic Health Act, 1875 (38 & 39 Vict. c. 55) s. 175, 60 & 61
117 (Local).

ɔf the Waterworks Clauses Act, 1847, provides that
ein, or in the special Act contained, shall be deemed to
ındertakers "from any Act for improving the sanitary
f towns and populous places which may be passed in
sion of Parliament in which the special Act is passed, or
session of Parliament. A Water Company by their
passed in 1897, and incorporating the Waterworks
1847, were empowered to erect and maintain a water
ɔecified place. Shortly after the special Act came into
:al sanitary authority of the district, under the powers
157 of the Public Health Act, 1875, made by-laws
at any person intending to erect a building should give
hority notice of his intention, and of the date on which
was to be commenced, and delivered to them plans and
t, and a description of the materials with which it was to
ted. The special Act did not incorporate the Public
1875, but contained no provisions inconsistant with s.
Act or with the By-laws:—

h respect to the erection of the water tower, authorised
al Act, that s. 93 of the Waterworks Clauses Act, 1847,
e effect of exempting the Water Company from the
f the Public Health Act, 1875, and that they were bound
vith the By-laws made by the local sanitary authority
Act.—Uᴄᴋꜰɪᴇʟᴅ Rᴜʀᴀʟ Cᴏᴜɴᴄɪʟ *v.* Cʀᴏᴡʙᴏʀᴏᴜɢʜ
'ᴀᴛᴇʀ Cᴏᴍᴘᴀɴʏ.)
1 Q. B. [1899] 664.

GENERAL NOTES.

THE HERBERT HOSPITAL, which was visited by the Queen on March 23rd, was designed upon the principles laid down by the Barrack and Hospital Improvement Committee. This work was entrusted to Sir Douglas (then Captain) Galton, assistant Under-Secretary of State for War, who designed all the plans and arranged every detail of the hospital. The plans were examined by Lord Herbert of Lea, and submitted to Miss Nightingale, whose practical experience was of the greatest assistance.

The Barrack and Hospital Improvement Committee claimed to have embodied in Sir Douglas Galton's design for the construction of the Herbert Hospital, all the best points in the best existing military hospitals, both at home and abroad. In the Herbert Hospital for the first time, provision was made for 650 patients, the building being divided into separate pavilions, each no larger than a regimental hospital. In this building Lord Herbert, Sir Douglas Galton, and Miss Nightingale were able to illustrate and carry out their views on hygiene and on all sanitary improvements, and the results of their work after nearly thirty years, has shown how wise their decisions were. Sir Douglas Galton's improvements in the sanitary conditions in the life of the soldier, founded as they were on scientific principles, have not only been evidenced by the decrease of mortality in barracks and hospitals in England and her Colonies, but in the diminished mortality of her soldiers in the field. A strong proof of the truth of this has been given more than once by the reports from South Africa, which have dwelt upon the altered condition of the soldier, and of his health and his habits whilst on active service, as compared with the Crimean War, owing to the regulations introduced and enforced by the Army Sanitary Department.

INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.—The Tenth International Congress will be held at Paris from the 10th to 17th August. The President of the Congress is Monsieur Brouardel, of the Faculty of Medicine of Paris.

The work of the Congress is divided into nine sections—dealing with Bacteriology—Alimentation—Engineering and Architecture—Industrial and Class Hygiene—Military and Naval Hygiene—General and International Preventive Measures—Hygiene of Transport—Demography.

Those members desirous of attending should send their names with the payment for Congress ticket, £1, to the General Secretary, Monsieur A. J. Martin, Rue de l'École de Médecine, Paris.

It would also be a convenience if they would at the same time inform the English Commitee, of which Prof. W. H. Corfield, is Chairman, and which meets at the offices of the Sanitary Institute, Margaret Street.

The English Committee will be very glad to give any further information with respect to the Conference to those who desire it.

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.—Part II.] [JULY, 1900.

JOURNAL

OF

E SANITARY INSTITUTE.

HE HEALTH OF SCHOLARS:

:IAL REFERENCE TO THE EDUCATION CODE AND THE BOARD OF EDUCATION ACT, 1899.

THUR NEWSHOLME, M.D., F.R.C.P.LOND.

(FELLOW.)

on at the Sessional Meeting, December 13th, 1899.

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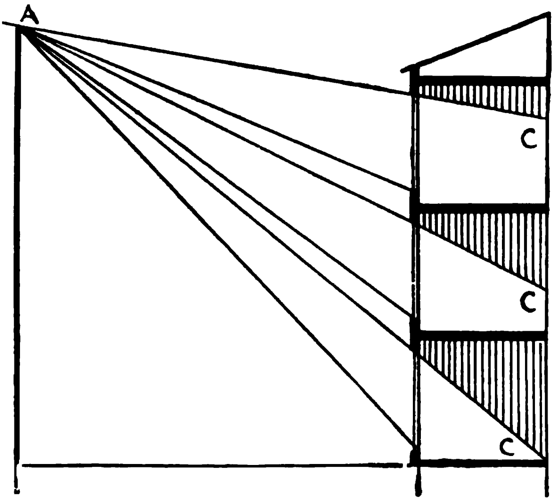
the greatest economy of effort and the maximum
sures for the promotion of the national health and
vention of disease should be in the directions in
is the greatest scope for their operation. From
ian standpoint, it is obvious that efforts to secure
standard of health among the young are of supreme
as upon the conditions under which they live during
teen—and more particularly the first ten—years of
pend very largely their future prospects of good or
f long or short life. Looking at the problem still
me standpoint, it is clear that while from one-third
of each day is spent under the conditions of home-
one-fifth of each school-day is spent under the
of school-life. The study of the conditions deter-
ealthy school-life is therefore only second in impor-
at of the conditions of healthy home-life. In
to open a discussion on this important subject, one
define for oneself certain limitations, as it would be
le, even it were profitable, to roam over the whole
the hygiene of school-life, including as it does
onsiderations of morals and of psychology, as well
s more commonly known as hygiene.
think be advantageous for me to confine my atten-
to the physical side of school hygiene, especially in
e fact that we are met together this evening to

discuss the health of scholars, so far as it is regulated by the Code of Regulations for Day Schools issued by the Education Department. This Code will probably be adopted in a modified form by the Board of Education to come into existence in April next; but we sincerely hope that the new Board will not rest content with a modification only of the regulations in the present Code, but that these regulations will be greatly improved, and that the conception of hygiene may be amplified to include every branch of school hygiene, whether dealing with the physical, the intellectual, or the moral aspects of health.

The 3rd Section of the Board of Education Act, 1899, states that "the Board of Education may . . . . inspect any school supplying secondary education, and desiring to be so inspected, for the purpose of ascertaining the character of the teaching in the school, and the nature of the provisions made for the teaching and health of the scholars," etc.; and, further, provides that "the Councils of counties or county boroughs may contribute towards the expense of inspecting under this section any school within their county or borough."

Although the terms of the above enactment are purely voluntary, and it is optional on the part of the proprietors and directors of secondary schools, of the Board of Education, and of the local governing bodies each and severally to refuse to take any share in carrying out the above scheme, there is little doubt that in the near future a large proportion of secondary schools, whether under private management or under the control of Committees or limited Companies, will be submitted to inspection in accordance with its terms. This being so, it is desirable that the scope of the inspection, so far as the health of scholars is concerned, should be freely canvassed, and that school proprietors and managers should know what may reasonably be expected from them. In ascertaining what is now considered by the Education Department to be indispensable to place school premises in an efficient hygienic condition, they cannot do better than consult Schedule VII. of the Code of Regulations for Elementary Day Schools, which specifies the structural requirements in the planning and fitting up of public elementary schools. As it is highly probable that these will form the model for similar requirements for secondary schools, they deserve careful and critical examination, although, as I have already pointed out, they form a part only of what is properly included in school hygiene. And here let me say that, although the contents of this schedule require and will receive considerable criticism, the Education Department has been instrumental, through its regulations and inspections, in securing a relatively high standard of structural excellency in entary schools, which appears, to those of us who ' those schools twenty years ago, deserving of the raise.

t in the time at my disposal touch upon all the points edule, and must content myself with discussing those most immediate bearing upon health. These are the ventilation, and warming of schools. On the first Schedule very properly lays stress on the necessity nt lighting admitted on the scholars' left; and, with nsion, giving further particulars as to the necessary between window-space and floor-area, especially ols are situated in narrow streets, would suffice for al requirements. The following diagram illustrates ance of this point. It shows a school of three stories, the opposite houses, A, are of the same height as the d at a distance from the school equal to its height. us that the lines A C divide each room into a region and less illumination, according as direct sunlight is r only diffused and reflected.

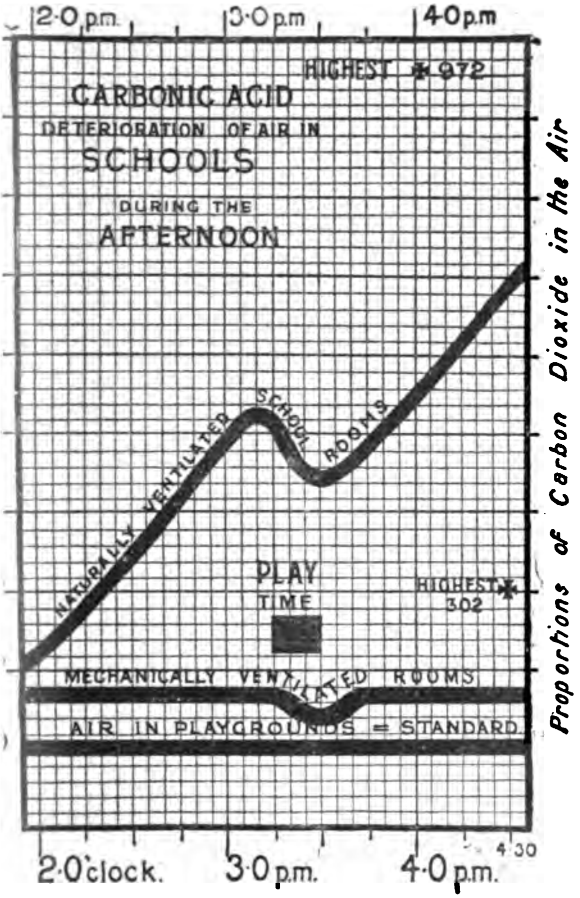


ilation the requirements of the Education Code are satisfactory. The amount of air which a scholar a given time depends primarily on the frequency the air in the school-room is changed, the amount ace affecting the problem by determining whether or hange of air can be carried out without personal dis- But although floor-space, *re* ventilation, occupies a secondary position, in practice this is only so when artificial means for pumping air into and out of the school are adopted: and even then too close propinquity of scholars greatly increases the danger of spread of communicable diseases.

The Education Department requires in new schools 10 square feet of floor-space for each child in average attendance. Allowing 12 feet for height, this means a cubic space of 120 cubic feet per scholar. Adopting the comparatively low standard taken by Dr. Carnelly in his most valuable experiments at Dundee, every scholar must be supplied with at least 660 cubic feet of air per hour. The problem, then, is how to change the air in the school-room six times hourly without producing such a lowering of the temperature of the room or such other inconveniences as will lead to the closure of the ventilating openings. In warm weather this can easily be accomplished by open windows and doors. In cold weather how is this to be managed? The Code states there must be "outlets for foul air at the highest point of the room," having "motive power by heat or exhaust." It does not contemplate the possibility of warming the incoming air: but inlets "are best placed in corners of rooms furthest from doors and fire-places, and should be arranged to discharge upwards into the rooms." We all know that when the cold weather comes such "inlets" will be carefully closed, and such air as enters the foul school-room will be insucked through fortuitous openings, often from most undesirable sources. Natural ventilation by open fireplaces, and by such openings as windows, doors, and Tobin's tubes, suffices for private houses, or even for small class-rooms, where (as seldom happens) the floor-space is so great as to enable scholars to be seated remote from the points of entry of cold air. But where a large number of children are closely aggregated in a small space (the usual condition of things), the case can be met only by warming the incoming air.

The fundamental error in the portion of Schedule VII. dealing with this subject consists in the separation of the regulations as to warming and ventilation. They are each a portion of the same problem, which can only be solved by their co-operation. The system of warming by hot-water pipes, with or without open fire-places, is alone contemplated, except that closed stoves are allowed under certain limitations. The system here chiefly named of hot-water or steam pipes without any provision for the entry of fresh air over them which is warmed in transit must be condemned *in toto*. The only legitimate plan is to combine the warming with the admission of fresh air: and in large schools there can be no doubt that mechanical must take the place of natural systems of ventilation if school-life is not e to be the source of much ill-health through the breathing of vitiated air.

r Carnelly's experiments at Dundee in 1889, which received ample confirmation from those of other have demonstrated the important facts that in the ols which are efficiently ventilated by the propulsion air of the proper degree of humidity into the class- l the aspiration of foul air from them by means of mount of carbonic acid, of organic impurities, and of e much less than in schools where hot pipes with or en fires are trusted to alone. The following diagram,



l by Dr. Kerr, the Medical Officer to the School r Bradford, illustrates the same point. Over 250 separate estimations of CO_2 were made, most of them in clear, calm weather during September, 1897. Using the atmospheric CO_2 as a standard (= 100) the proportion of CO_2 in the air at 2½ feet from the floor in the centre of mechanically ventilated class-rooms was found to be maintained steadily throughout the afternoon at about 200: while in naturally ventilated school-rooms in similar positions, at 2 p.m. it stood at 200, increasing to about 500 by 3 p.m., with a slight remission during the interval for play, and then showing a gradual increase to about 700 by the time of dismissal. Wide variations were found in the naturally ventilated schools, the worst recorded being (= 972) at 4 p.m.

The preceding remarks apply chiefly to large schools. In small school-rooms we may trust to natural ventilation through chimneys, windows, doors, and Tobin's tubes, combined with the admission of warm air from a Galton's, Hygiastic, or Manchester stove, or some other stoves on the same principles as these.

Did time permit, we might discuss the size of air inlets for each scholar (two and a half square inches) prescribed by the Code, which is insufficient for unpropelled air; and the position of outlets for foul air (at the highest point of the room), which is the very worst position, if a mechanical system of ventilation be adopted, or even without this, if the in-coming air is warmed by passing over hot pipes. The problem of the ventilation of schools towers over all other problems in importance; and upon its satisfactory solution depends in a large measure the healthiness and efficiency of school-life In certain schools, whose size is larger than the number of pupils requires, natural ventilation may suffice, but in the vast majority mechanical ventilation undoubtedly represents the ideal to be secured. Although warmed air mechanically propelled into school-rooms costs money, it repays the additional expenditure in improved health and power of work. Dr. Wheatley states that at Blackburn a large manufacturer, by adequately ventilating his weaving sheds, increased his output two and threequarters per cent. Dr. Carnelly's classical report, already quoted, mentions the fact that among nine mechanically ventilated schools the average Government grant earned per head was 21s., among ninety-five naturally ventilated schools it was only 18s. 3¼d.; and a portion, at least, of the explanation of the difference in grant-earning power of the contrasted schools lies in the proved excessive impurity of the air in the latter.

Next to lighting and ventilation, cleanliness of the school-room is the most indispensable condition; and now that we

t the chief causes of disease are particulate, the
e of frequent wet cleansing of school-rooms is in-
The substitution of frequent washing and scrubbing
ıg and sweeping will immensely aid in minimising
in school-life. Much also depends upon the cleanli-
ıolars themselves. I have recently suggested a scheme
ighton School Board, which is now under their con-
If this scheme be adopted, scholars certified by the
)fficer of the School Board to be suffering from such
ommunicable complaints as impetigo, ringworm, and
vill be excluded from school, and the Medical Officer
ı will certify to the Education Department or the
e Board of Education, under Sections 81 and 101 of
ıtion Code (1899), that the children in question have
uded by order of the Sanitary Authority to prevent
l of disease. It will then be practicable for the school
s to claim the average grant for children thus excluded
erest of other scholars. At the same time it is pro-
t pressure should where required be brought to bear
parents of such children by the co-operation of the
r the Prevention of Cruelty to Children, or by other
t will be seen that this proposal is simply an extension
communicable diseases of measures already practised
to acute infectious diseases. The Medical Officer of
time is too limited to enable him to concern himself
with chronic communicable diseases, but there is, I
ry reason why he should use in the manner indicated
legal powers which he possesses in aiding School
ınd the Managers of Denominational Schools in
g such complaints as ringworm and lousiness, which
t are unfortunately rife in many schools, and which
their efficiency and reputation.

rings us to the consideration of the relation of ele-
lay schools to the spread of acute infectious diseases.
)fficers of Health cannot be dissatisfied with the ample
onferred on them by Section 88 of the Code. Two
of the Sanitary Authority, acting on the advice of the
Officer of Health, can enforce the immediate closing
ementary day school, subject only to an appeal to the
n Department *after complying with the notice.* The
this important regulation is greatly diminished by the
no similar powers exist for the closing of schools other
ıentary day schools, including private, secondary, and
chools. An extension of legal power in this direction is
required, in order that the full utility of school closure
ecured. It does not require much foresight to see that

the proposed voluntary inspection of secondary schools under Sec. 3 of the Board of Education Act, 1899, will be superseded in a few years by compulsory inspection of all schools in which the children of the nation are educated; and even before such compulsory inspection is enforced for "the purpose of ascertaining the character of the teaching in the school and the nature of the provisions made for the teaching and health of the scholars," Sanitary Authorities may reasonably ask, in the interest of the community, for the powers given under Sec. 88 of the Code to be extended to all schools.

Such powers obviously ought not to be, and, I believe, are not used except when the circumstances of an epidemic really render it necessary. Perhaps, however, too little attention is paid to the power to exclude all children coming from infected houses, or even children coming from the same street as that in which a case of infectious disease has occurred, or again children who are known to have sat in a class-room in close propinquity to a recent case of infectious disease. This exclusion of single scholars, or of groups of scholars, or even of a whole standard, requires more careful and detailed investigation than closure of an entire department or school, but my experience has shewn me that it is often amply sufficient, at any rate so far as notifiable diseases are concerned. For non-notifiable diseases, particularly measles, more extensive closure is often necessary. Time will forbid my more than alluding to the system of notification by school teachers of absentees who are suspected to be suffering from infectious disease, which we have successfully adopted in Brighton, and for details concerning which I must refer you to the *British Medical Journal* of September 2nd, 1899.

Those who are most familiar with the conditions of medical attendance among the poor will agree with me that even the most rigid system of medical inspection of schools and the most elaborate enforcement of the Infectious Disease (Notification) Act, do not cover the entire ground, so far as the prevention of the spread of infectious diseases by school attendance is concerned. Under the conditions just assumed, children having had slight attacks of unrecognised infectious disease will still continue in a certain number of cases to resume school attendance before they are free from infection. Medical inspection and inquiry into the history of *all* temporary absentees before they are allowed to resume school attendance would do much to reduce the evil. But even then many cases, *e.g.*, of scarlatina, would be missed, the premonitory symptoms having been slight, the rash having disappeared and desquamation not having begun. Nor can parents be seriously blamed for not calling in medical

ments which appear to them slight and insignificant;
such ailments are in reality a frequent cause of school

ve recently had discussions as to the provision of
kfasts for underfed school children, to be supplied,
rivate philanthropy, nor under the control of the
Authorities, but by the School Board. I will only
o make two remarks on this question. Firstly, it
, physiologically unsound to assert that an underfed
n a worse position for maintaining his strength in a
ied school-room, in which he is expected to do a
nount of brain-work, than in the streets, in which
ecessarily activity—and consequently expenditure of
f both muscles and brain, with a much greater loss
n the shape of heat. In the second place, if there is
intervention on the part of public authorities in the
ip between parents and children, it should be in
in which the least possible hurt will be given to that
esponsibility and self-reliance which stimulates effort
prise, and raises the character of those who manifest
at the present time the conditions of medical attend-
he non-pauper poor—the class of labourers, who, in
towns, for instance, earn not more than twenty-five
week—are not satisfactory. Either they are obliged
heir children to the out-patient departments of our
itals and dispensaries, or they fall into the hands of a
edical men who, by the exigencies of their position,
d to give advice and medicine for a shilling or less,
to compensate for the smallness of the fee, have to
a large number of patients that they cannot give
attention to each. Still oftener these children fall
hands of druggists, who diagnose scarlet fever as
h, diphtheria as ulcerated sore throat, and so on.
t brings me back from a somewhat wide digression.

than attempt to usurp the place of the parent or of
d of Guardians in providing food for the underfed
he School Board might, with no additional interference
sense of independence of parents (which is already
ed, so far as medical attendance is concerned) provide
ical diagnosis for poor children who are suffering from
ments, for which the parent cannot afford to call in a
It is doubtful if the School Board is the best authority
is. The largely increased use of hospitals and dis-
, without any sense of pauperisation, appears to point
rection of the provision of State doctors for each dis-
t as there are now state teachers, both to be paid out

of local or imperial funds. If such State doctors could be provided for school children, and their services were freely available for the labouring classes, there would be an immense diminution in the incidence of infectious diseases in connection with school-life. The subject of infection in relation to school-life is very extensive, and I can only in passing from it refer further to the paper in the *British Medical Journal* (2nd Sep., 1899) and to remarks in my work on "Epidemic Diphtheria" (page 135 *et seq.*).

Let me add that I am fully alive to the great benefits which the community is reaping from our rapidly improving system of universal education, and that I value this education so highly as to consider the amount of sickness and mortality caused by school attendance under present conditions not too great a price to pay for the benefits which the community receives. At the same time it is quite practicable to ensure in the directions already briefly indicated a continuance, and even a great increase, of these benefits, with a great diminution of the risks to health now associated with school attendance.

The prevention and cure of defective vision and the cure of deafness caused by adenoids (thickening growths in the posterior nares) open up another question of great importance in school hygiene. Much "artificial stupidity" would be removed or prevented were each scholar medically overhauled at regular intervals, and the proper treatment applied. Elementary school authorities would, if they could arrange for the proper treatment of cases detected by such medical inspection, probably secure in increased grant more than sufficient to pay for the medical aid. The general efficiency of school-work would be increased by securing for physical laggards a condition of health which would render them no longer an impediment to the class-work.

These and other like problems it is impossible for me to discuss. I have already sufficiently encroached on your time. I may however mention, in conclusion, the excellent syllabus prepared by the Sanitary Institute for an "Examination in Practical Hygiene for School Teachers," recently inaugurated by this body. A perusal of the complete and educative syllabus arranged for this examination will show that it covers all branches of the theory and practice of hygiene in its application to school-life; and as school authorities begin to realise more fully the importance of having on their staff teachers practically acquainted with this subject, there can be little doubt that this new departure of the Sanitary Institute will be not only successful, but productive of great good.

add in conclusion that the Council of the Sanitary
have already decided—
memorial be addressed to the Education Department
the hope of the Council that the instructions given
pectors for carrying out the inspection contemplated
:t would be of such a nature as to comprehend all
f hygiene in their bearing on the school and school-

the new Education Board take this comprehensive
s prospective duties, a new era of greater and more
·ess in our national education would be ensured, and
have done our best to ensure a simultaneous and
ınce in national health and national knowledge.

IRMAN (Mr. J. H. Yoxall, M.P.), in opening the discussion,
sure they would all agree with him that Dr. Newsholme
fore them considerations which would afford a sound basis
on. Dr. Newsholme had said that he could not possibly
er the whole ground indicated by his title, and no doubt they
care that those matters to which he had more particularly
ould receive their due share of attention. At the same time,
think the lecturer would wish the debate to be exclusively
those particular points; and no doubt it would be useful
te proceeded upon the lines of the memorial adopted by
y Institute, which had been addressed to the Educational
t, expressing the hope that the sanitary inspection under
ducation Act should comprehend all branches of hygiene
ring on the school and school life. Dealing with one or
which had been raised, the Chairman remarked that a
f the bad sanitation of our elementary schools is due to the
chools, and, even in the case of new Board Schools, or where
its of old schools were carried out, they reckoned their
tendance upon the basis of eight square feet of flooring-
upil. The ten square feet, which Dr. Newsholme had spoken
proval, was hardly sufficient for the purpose, but certainly
re feet is very seriously insufficient, and a very great
schools in this country, with their class rooms, and infant
upon the eight feet square basis. Now it did not seem to
nybody's while to attack the eight square feet basis. It
orth while for school managers, or school boards, or others
ion in the matter, because one consequence might be that
boards would be called upon to further spend the local
uilding schools to receive the children excluded from the
ols by the extension of the eight square feet to a limit of

ten square feet. It was not particularly worth the teachers' while where the salaries depended upon the average attendance. Therefore, unless a body like the Sanitary Institute were to take up in earnest this abominable limitation of floor-space, he did not quite see what other body could take it up, and what lance was going to lay it low. He ventured to hope, therefore, that all members of the Institute would keep their eyes fixed closely upon this question, which was of the greatest possible importance. Then Dr. Newsholme had spoken with regard to natural ventilation being applicable to small schools as a rule. He (the Chairman) did not understand him to advocate it for small schools, but that the ills of it in small schools would be less than they are in large schools. Having visited a good many country schools in the course of the last ten years, all of which were mainly upon the eight square feet basis, and all upon the natural ventilation system, he was bound to say that the natural system of ventilation in small schools was quite as harmful, if not more harmful, than one feels it to be, almost without scientific tests, in the larger schools. He did not know anything quite so bad as the atmospheric condition of the average rural voluntary school, and this was quite true also in many cases of the rural board schools. Fortunately the children had the open air and playground to counteract the bad influences of the school-room; if it were not so he could understand, even better than he did at the present time, how and why the depletion of the villages and immigration into the towns was taking place. The subject of school architecture, he was pleased to think, now included the question of sanitary arrangements of all kinds, and this was exceedingly important. Since he had grown up and become associated with schools and school building, he had ceased to wonder how Martin Chuzzlewit could have become a full-fledged architect, and learnt the whole mystery of the profession, in the space of three months. The planning of schools includes other questions than drainage, or ventilation, or isolation from infectious diseases, water supply, and details of that character. It included a proper structure and a proper arrangement of the buildings. It was important, of course, that the light should fall from the left upon the children's desks and copy-books. It was also important that the school, if possible, should occupy the proper aspect, so that the sun could be utilized to the fullest extent, and for a clear passage of air all round the buildings, as well as in other respects upon which he need not dwell. All these things were important in school plans, and then came the question of furniture, the designing of the furniture, the size, the proportion of the fittings, and so on, all of which had to be considered when dealing with the question of school hygiene. The position of the desk, for instance, was important, because a badly proportioned desk, if it affected the spine of the child, produced undue and unnecessary weariness, damaged the sight, and necessitated a strain which the child ought not to have to bear, and which could be avoided. Then, too, the question of the blackboards, their position, their surface, and so on, were of the utmost importance in relation to the eyesight of the children. There was also the question of play and the organising

Personally, he felt that the organisation of the play of the as as important in its way as the organisation of their nd he thought that more time and attention could be lirected to teaching the children how to play properly. uestions were bound up in the general subject of school d he believed that it was one which could be profitably ot only on the lines on which Dr. Newsholme had con- ut on other lines with which he had found it impossible

E. **Shelly** (Hertford) thanked Dr. Newsholme for his paper which opened up all sorts of possibilities for dis- Vith regard to the question of games they must not forget lucation of a child is a twofold process. It is not only ntal and moral training, but also physical, and the two raining must go hand in hand if the double product is factory. The physical training of a child he held as in condary to its mental training. Sir George Humphrey, remarked that ignorant stength is less dangerous than bleness, and, perhaps, one of the dangers in the present of things in this country was that the striving after a ntal standard led also to the neglect sometimes of the spect of education. Still, within the school itself, we se that learned feebleness rather than ignorant strength, come later on, should by pressure or force of circum- drawn into the right path. Physical training is a thing extremely difficult to meet in Board schools, and schools ar character. The problem was one which confronted cationalist, and as he had for twenty-five years been interested in school hygiene, and three at least of those spent as a school-master, he might, perhaps, claim the cationalist. No extra work or extra burdens which are wn upon teachers of elementary schools could, he thought, oductive in the future than such as would enable them to train their scholars during the hour of play. An enormous f lessons of the greatest possible value could be learnt y hours by school-children. In our enthusiasm for the by England's sons, it is worth while sometimes to remember ing to the lessons which they learnt of forbearance, courtesy ge under defeat, and other good qualities, lessons which t under conditions which still happily for us we regard as these things could be learnt, even in the small play- f our board schools, and anything which could be done for g of the board school, or elementary school staff, he held rection would result, not merely in a development of the girls physically, but would result in far better work being tally by the same individuals. Dr. Shelly then proceeded th the question of ventilation, and referred to the results y a German investigator, who found that the work of pidly deteriorated in proportion as the air of the school-room became vitiated, and he also found that the mind of a boy or girl was not capable of continuous work upon any mental problem with satisfactory results for more than forty or forty-five minutes at a time. Somewhat similar experiments had been carried out in America, which went to show the great desirability of a frequent change in the kind of work. The usual school text books explained that the best work could not be expected from a child in the evening, or in the later hours of the day. Under ordinary conditions that was perfectly true, but, looked at in another light, there was no physiological reason why the child should not do as good an hour's work in the evening under favourable conditions as it does in the morning under equally favourable conditions. While it is necessarily obvious that school life should form one of the most important subjects for national consideration, because of its national importance, he doubted very much whether, with the most they could do, they could hope to achieve a very great deal for the present generation of scholars, for the reason that the value and importance of school hygiene would be largely educational. The average scholar in the elementary school spends only one-fifth of its life in the school, and something like three-fifths of its life in the home. Until, therefore, they got the health conditions of the home improved, nothing much could be done in the way of improving the welfare of the children of the present generation, but, on the other hand, it was not to be forgotten a vast improvement had taken place in the raising of the standard throughout the country, especially in the larger schools. Until they got public opinion stimulated by associations like the Sanitary Institute, and the influence of public opinion brought to bear upon the tenants of houses, and the builders and owners of houses, to make them habitable, and proper dwelling places more in accordance with the schemes of perfect hygiene, the school hygiene would be rather educational to the scholar than directly beneficial to him. None the less was it important that what he learnt at school should be of the right kind, and learned in a right way. Dr. Shelly then took exception to the suggestion of Dr. Newsholme that the air supplied to a school should be warmed, and gave numerous scientific reasons for his contention that cold air was by far and away the most healthy and best for human beings to breathe.

Mr. SHIRLEY MURPHY (London) expressed his sense of the value of the paper Dr. Newsholme had so admirably placed before them, and referring to what the author had said as to the floor space allotted to children in elementary schools, observed that inasmuch the children were generally allocated to something more than half the room—to some two-thirds of the room—the actual floor space for them was still further reduced. Thus the floor space for each child as actually provided was only a portion of the eight square feet to which it was entitled. Dr. Newsholme had touched upon a question which had been of much interest to him lately, namely, the steps which were taken for dealing with infectious disease in schools. Dr. Newsholme had very properly pointed out that the closure of those schools, which s a very considerable interference with education, is not o be done without grave consideration as to the necessity step. He, Mr. Murphy, could not help thinking that the ficer of health as he gets more opportunity of learning what ions existing in a school are, would be better able than at attain his object, by the exclusion of particular scholars, sing particular class-rooms, instead of closing the whole No doubt through the Notification Act, medical officers do ow of a good many cases of infectious disease which occur stricts, but they do not learn the whole story, and the fact at there are a number of cases of infectious disease, which e to light at all; so that a medical officer of health, when that he has infectious disease in a particular area of his d knows distinctly that it is spreading in the school, if he imply to take the notification list and exclude from school en whose diseases are recognised and certified by medical t in any way arming himself with the knowledge necessary g with the prevention of infectious disease in the school. inquiry at the homes of the children, which in many cases essitate a visit to 200 or 300 separate houses, it was now to ascertain all the facts necessary for a proper exclusion ildren who were vehicles of infection. If the medical officer itted to examine the children in school, he might do in a in the school what would otherwise take a prolonged d be able to obtain information necessary for dealing with ak by exclusion of particular scholars; whereas under the ystem in such cases he is often driven to the extremity of whole school in order to prevent the spread of infectious The examination of the children in school would safeguard en who were not at that time affected by giving opportunity emoval from their midst of children suffering undoubtedly ctious disease, whose diseases had not been recognised and cted. He believed that in particular places medical officers are not refused admission to the schools, but in some they sed admission, and he could only hope that the new Board tion would, when they came to consider the subject, decide s might be taken to give to medical officers of health under a better method of dealing with infectious disease than was to them. He thought if the school authorities would look medical officer of health as a friend, a man as much interested or any other intelligent citizen, in the maintenance and n of education, there would be no difficulty whatever.

MES KERR (Bradford) said that Dr. Newsholme had done very set before them the ideals of education to some extent by g the code which simply lays down a minimum requirement matters they were discussing. They might look at what the cation should be, or at least what was suggested to his mind. e education for all our children now provided by the State, e are, as one speaker pointed out, two kinds of education—

there is the formal education, the artificial education which civilization requires which is provided in the State schools, and there is that natural education which the child has, if it has ordinary abilities, of picking up for itself. At the same time, under the conditions which exist in the large towns and for the majority of our children, natural education is not taking place as it ought to be, because if we examine the vision of children in large schools we find a delay of four or five years before they attain their maximum acuity. In the large schools of the towns the children suffer from a lack of sufficient exercise. Great difficulty stood in the way of adequate and proper observation, because of the reasons which Dr. Murphy had put forth, namely, that the inspection of children in schools is not legalised in any way, and that to handle children is technically an assault. He had been in communication at various times with the Department about this, but as yet they had been able to obtain no legal protection to the school officer, or medical officer of health who attempted to make the necessary inquiries, and this was a difficulty which required to be remedied. With regard to ideals, we owe much to the Act of 1870. All these questions have cropped up in recent years, and he thought that a new Act was now required, an Act which would compel every child, of whatever rank in life, to be educated in the State schools, and then we should have State schools fit equally for the nobleman's son, as well as for the offspring of the slums—schools of course kept up by Universal School Boards, which institutions would have high minimum requirements in all these details. But with regard to the question of warming, he thought that nowadays it was necessary that schools should be well warmed, for the reason that a great deal of the work is hand and eye work, and this could not be well done by children who had cold fingers. They must have the temperature kept up to a certain degree, in the case of infant schools especially, and in the latter also it was desirable to remember that they have a very much greater surface area in relation to their weight than the older children have. A chronic complaint of school children he took to be Carbonic Acid Poisoning, and one could not insist too strongly upon this point, that the error in all our schools and school buildings is defective ventilation. Many complaints of childhood, he believed, were due to the bad air which they breathed in schools. Having referred to various systems of ventilation, Dr. Kerr expressed his opinion that some system of mechanical ventilation ought to be adopted in every schoolroom, big or little. He considered that bad school ventilation was responsible for assisting the spread of tuberculosis, a personal view which he thought was supported by the statistics of phthisis at school ages. The natural explanation was that school air was fouler than the air of the home. Then as to encouraging the personal cleanliness of scholars, towards which Dr. Newsholme had been doing something at Brighton, they in Bradford, for the last four or five years, had also been working in a similar direction. Circulars were sent round to the parents, and at last they were beginning to pay attention to the directions which had been given. If sanitarians kept on hammering in this way, at last they produced

e effect. With regard to free breakfasts, they were much
at Bradford with people suggesting this step. The ill-
ent of children was due to a number of complex causes.
pure air and exercise had a great deal to do with it. The
was no doubt a difficult one. He thought the principle to
'ed was that the community should provide those things
: individual could not be expected to provide for himself,
swimming baths and so on, but every man ought to be
to provide his own child with breakfast. Next to ventila-
uestion of the prevention of the spread of infectious disease
s was the most important matter. A great deal might be
by providing a single seat for each scholar instead of the
s. Thus preventing the crowding together of the children,
rd they had these single seats for the majority. Dr. News-
:ld strong views with regards to schools closure. Now
osure was not scientific, because it was merely a temporary
Schools were closed in order to allow the disease to pass
the material was still there, and in a short time another
would break out and the school would have to be closed again.
20 departments at Bradford there was always an epidemic
re, and they could not be always closing schools. One school
closed there three different times this year, and he had
:fused to close it again. Children must be educated and
t take their risk. The idea which had been thrown out by
sholme, that of the inspection of all children, was what he
:hey were coming to. If any child was ill and could not go
its parents had a right—whether those parents were high or
have a doctor provided by the State to come and see their
Ie did not think that State doctors should be provided—a
:h gave rise to many petty jealousies and troubles among the
men, especially in the lower ranks of the profession—but
parents should be allowed to go to any doctor they liked,
fee should be paid by the community. In this way he
they would have the unanimous support of the profession;
ıld get early advice as to what was the matter with the
ey would save money in hospitals and for disinfection of
prevent the spread of infection, and keep up the average
:hool attendances. These advantages would compensate the
ity for the expense which might be involved, and at the
e protect children from infectious disease. Defective vision
ound to be very common in Bradford, and he believed the
aggravated by parents taking their children to quack oculists
n, a class which had multiplied of late in Bradford. With
o all the matters which had been touched upon that evening
ght that the outlook was exceedingly hopeful, because
r they turned they found that physiological and scientific
were replacing the old rule-of-thumb methods. The old
' ways were giving place to scientific principles. In every
ent there was a diminution of nerve strain and a growing
y in the work children are doing.

Mr. J. **Osborne Smith** (London) thought it was extremely interesting as well as profitable that this discussion on the health of school children should take place just before the new Education Code came into force. Of course they did not presume in any way to dictate to their masters, but if what they had heard that evening were true, its representation to the Board would do a great deal of good. With a great deal of what he had heard that evening he was not in accord, for a long experience showed him that they were rather beside the mark. Many schools had been put up by persons who ought never to have touched a school building. In many schools there was not only defective ventilation but defective arrangements generally. Many of the elementary schools were not fit to be schools at all, but these were chiefly in the rural parts. He had seen one in which all the rooms were too lofty and the windows all faced due west, and although it was expensively built it was designed on entirely wrong lines. Then there were schools which were built on the eight and ten feet basis, which had all the children squeezed up too close together. They could not do without the floor space, nor without some method of warming; the fire-place should be in suitable relation to the door, and the windows must not be put behind the black-board, as some he had seen were even in London. The schools too should not be built right up to the pavement in a noisy thoroughfare. Thus, as the Chairman had said, there were a great number of things to be taken into account in designing a school which would be suitable and healthy for school life. He was glad to see that there was a chance of getting an increase in the floor space of elementary schools, and they would probably get it put up to ten feet; in endowed and secondary schools, with which institutions he was particularly familiar, their standard ranged from twelve to eighteen feet, and sometimes went to twenty feet. There was a mistaken idea that you could add to the eight square feet by going upwards, but there were a great many drawbacks attached to that method of getting over the difficulty. It was floor space that was required. He thought also it was most desirable to cultivate in children a love and reverence for fresh air; they should be encouraged to live in the open air, and to wish to have the windows open instead of having them shut and the air pumped in. This idea of relying upon air forced in through dark and dusty channels seemed to him a horrible state of things. If they had sensible teachers it ought not to be impossible to keep the air of the school-room as fresh and sweet as the air outside the building. Attention to all these minor details was necessary, and therefore he welcomed this system of inspection. The inspectors would, of course, be men of education, and they would see that all these matters were attended to and enforced, with the result that they would get healthier schools in the future. He had much pleasure in proposing a hearty vote of thanks to Dr. Newsholme for his interesting paper.

Dr. **Glover Lyon** (London) seconded the motion and said that Dr. Newsholme had done great service to the Sanitary Institute by

he matter forward in the way he had done that evening.
nything was to be said against that paper. Fresh air was
wanted, and although a certain amount of floor space
ted, this did not necessarily ensure good ventilation. This
ned to be left out in the proposed Act. The size and
the inlets had to be considered, if a draught was to be
and especially if the air was to be let in cold. He did
the question of damping the air was quite settled yet.
had been made to forced ventilation and heated ventilation.
degrees heated up to 60 degrees, and filtered without
s exceedingly pleasant to breathe. That was his impression
rom some experience. They must always remember that
ded room, the occupants were continually damping the

IRMAN remarked that the debate that evening confirmed
is impression that the Sanitary Institute was doing an
ork in the matter of general education. At any rate, the
tood practically unassailed and unshaken, though upon
portant points there had been useful criticism.

SHOLME (Brighton), in acknowledgment, said that he was
perfunctory a contribution as his own had raised so useful
ant a discussion, Even if it had only been for the remarks
r, it would have been worth while to have attended that
at gentleman's experience in the details of school manage-
ygiene, under most difficult circumstances, being unrivalled.
Yoxall's remarks they could see the advantage of having
n one who knew exactly the conditions of school life in
of the country, and they were much obliged to him for
that evening. When the Chairman enumerated the many
itted from the paper, he (Dr. Newsholme) had thought
ch better paper he might have made it, but those points
urposely omitted with a view to promote discussion. With
he thought there was a good deal to be said in favour of
e of warm air, but under present conditions he was afraid,
easons, we must have recourse in some shape or other to
though by all means let them have the best means of
he air. Mr. Osborne Smith's experience was evidently
more particularly with secondary and grammar schools and
e schools than with elementary schools. In elementary
e smallest classes were usually composed of at least sixty
nd under these conditions natural ventilation presented
t possible difficulty, for the children were mostly im-
fed and generally imperfectly clad; the introduction of
them was a much more serious and dangerous matter than
ction of cold air to a similar number of children who were
d clothed, although the introduction of cold air was itself
nt thing. Mr. Shirley Murphy had emphazised some of
raised with regard to the closing of elementary schools,

and there was no doubt the Council of The Sanitary Institute would do a great good were it to petition the Education Department, or the new Education Board, for the extension of closing powers to other than elementary public day schools, for instance, to Sunday schools and secondary schools. It would also do good if, as suggested by Mr. Murphy, the Institute petitioned for power for Medical Officers of Health to inspect school children at school. In London, at the present time, owing to the unfortunate action of the London School Board, such inspection is resented by the School Board authorities, and is regarded as a sort of trespass and technical assault upon the children. Any Medical Officer of Health who made such inspection subjected himself to the possibility of a serious reprimand. This was not a proper state of things, and the London School Board and the sanitary authority ought to co-operate, they ought to have the same object in view in regard to the health of the scholars, so as to decrease the amount of infectious disease. He hoped that the meeting and the action of the Sanitary Institute would lead to such power of inspection being given in the interests, not only of the scholars who are healthy, but also of those who are suspected of being the cause of illness to others. That would be a great step in advance. Dr. Kerr raised some important points: he said that school closure was not scientific. Well, we had to do many things that were not scientific, which were merely empirical; we had not got to the region of pure science yet, though some day we should, and in the meantime we must act to some extent empirically. He for one should be sorry to give up school closure entirely, though he believed that other less drastic measures had not been up to the present utilized as completely as they might have been. Dr. Kerr pointed out that by closing schools we were only postponing epidemics, but he forgot that every additional year a child lives without getting an infectious disease, more particularly scarlet fever, the less liable to infection it becomes, until the tendency altogether is eliminated. So that it was a great public benefit to postpone epidemics, even if later on they are inevitable. Dr. Kerr's suggestion as to inspection by ordinary practitioners was a good one, but it was doubtful whether such good results would be obtained by allowing any medical man to inspect, as by obtaining the services of one specially qualified man.

INSANITARY CONDITION OF LONDON STREETS.

V. NISBET BLAIR, M.INST.C.E., Engineer and
Surveyor, St. Pancras Vestry.

(FELLOW.)

rks introducing Discussion at the Sessional Meeting, February 14th, 1900.

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been invited to open a discussion on the above subject, pears to be a simple matter to undertake the duty, as ot likely to meet with contradiction in making the that our streets are frequently in a very uncleanly , though whether this necessarily means an insanitary is at least open to argument. I rather hold that, rate for a time, it does not; for until decomposition es the multiplication of bacterial life, which I suppose rejudicial element, does not make any progress. The has of course an important influence on this develop- d some of us have probably experienced, at times of d heat, an indescribable but certainly offensive smell rom perhaps a loosely constructed Macadam road, or an -paved road where the fibres are crushed and spongy, from an asphalte road when the sun's heat exercises a ffect with most noticeable results.

the request was made of me I cannot say, but it is at curious that I should be called upon now seeing that ecessor in office was asked, in 1884, to prepare one of dbooks issued in connection with the International Exhibition, its title being "Cleansing Streets and the Metropolis and large Cities." This handbook deals lerable length with other subjects than street cleansing. also of the collection of house refuse and its utilization; watering, and to some extent of street construction; e I have only to deal with the subject standing as the his paper, it is obvious that the condition of our streets ery large measure dependent not merely upon the use ade of them, but also upon the materials of which they tructed, and the manner in which they are treated, not regards the removal of slop and dust, but also the g or sanding to prevent slipperiness, and street also.

It has been said that the question of street cleansing is only a difficult one to deal with by reason of the immensity of the areas and quantities of materials to be dealt with, and the consequent expenditure; to a very great extent this is true beyond dispute. This being so, it may be argued that there can be no reason beyond the question of cost why the whole of the streets of London should not be continuously maintained in a better condition as to cleanliness than they are at present. There may be differences between certain districts in the degree of sloppiness which is found at times to exist, but in the course of continuously bad weather a small district has a distinct advantage, and the 6 miles of streets in St. Olave's or 6¼ in St. Martin's offer a very different problem to the 140 miles in Lambeth and the 120 in Islington, and if the same sum per mile were spent on the larger districts that might be spent without its being perceived as affecting the rates in the smaller districts, then the rates in the former would become so heavily weighted that there would doubtless be some outcry demanding economy. While we must be limited to some extent by the question of economy it must not be thought that no attempt towards improvement is being made, even at a somewhat increased cost, and I have heard it admitted many times that the condition of our streets is now immensely improved upon what it was ten or more years ago.

I have obtained information as to the alteration in the method of working, and the cost and the quantities of material removed during the period of about ten years in the Parish of St. Pancras, in which the mileage of streets may be taken as 86 throughout the whole period.

In the year ending March, 1891,

Labour in Street Sweepings cost ...	£9,789
Removal of Sweepings	7,476
Total ...	£17,265

181 men being employed.

At this time the labour in cleansing was entirely manual, but the removal was by carts and vans supplied by contractors, and in these contracts there were attached lists of streets to be cleansed so many times per week. Taking one contract as an illustration, Ward 3, named 49 streets to be cleared once a week, 9 twice a week, and 3 three times a week, none daily except cab ranks. Out of the whole number of streets within the Parish —about 750—only 50 were required to be cleansed daily, and I find it recorded that about 69,000 cubic yards of material were removed in one year.

In the years 1892–3 machine brooms were introduced upon ds, the proposal being justified by the contention that ooms would displace a large amount of the hand-labour d, the idea being that they would effect an economy in well as an improvement in the way in which the work e, that is in the speed at which the work was done; but the Local Authority is to be commended for the manner h it followed out the idea, for in March, 1894, I find

The hand-labour cost	£10,620
Removal of Sweepings	13,408
Total ...	£24,028

Number of men employed, 183.

, although eight machines were in use, the hand-labour reased in cost by about £1,000 by reason of higher f wages being allowed, and the removal increased by 6,000; of this about £1,000 was the cost of horsing the so that £5,000 can only be accounted for by the fact ere was more material to be removed, namely, about cubic yards, or 20 per cent. more than in 1890.

whole of the differences however are not shown by the g figures, the schedules attached to the older contracts, the streets to be cleared so many times per week, were , and it was provided instead that every street should red as often as material was swept up by the street s or machines employed by the Vestry; and it was d that every street should be visited daily, and now in ather the more important streets are frequently swept out three times per day instead of two or three times k.

e year ending March, 1899,

The labour cost	£11,420
The Removal of Road Sweepings...	13,060
Total ...	£24,480

(Equal to £280 per mile.)

sweepers were employed, and during the same period ,000 cubic yards of material were removed.

ng the whole of London within the limits of the London Council and including the City to have 1,983 miles of , and estimating that the work in St. Pancras may nt an average for the whole of London, the material d would work out at 980 cubic yards per mile, or close 0,000 cubic yards per annum for the whole of London.

doubt there are variations between one district and another in the quantity of material removed, in the cost per mile expended on scavenging, and in the class of scavengers employed, but the character of the labour is not such as to attract the most physically capable men; and while in the main streets where work goes on while the traffic is running it is necessary to have men with all their faculties and full physical power to do the work, at the same time that they are keeping watch against the dangers in which they work, yet in the quiet streets of little traffic it is a class of labour upon which aged and less capable men can very well be employed, and are better so employed even at a lower wage than turned adrift to become chargeable to the Poor Rate. It is within the knowledge of other Surveyors how a man, told that he is no longer able to do the work, pleads against being condemned to idleness and the workhouse, and with that feeling I am sure we all have sympathy, but this cannot be displayed by leaving useless men upon the weekly wage sheet.

While such is the character of the work upon which the scavenger is now employed, it is interesting to find that the origin of the word conveys a very different idea of the duties of the scavenger. In the handbook I have referred to prepared by the late Mr. Scott, he says that according to the great lexicographer a scavenger is "a petty magistrate whose province is to keep streets clean," and I find from another Dictionary that he was "a person appointed to collect 'scavage,' an ancient toll exacted of merchants and strangers for goods offered for sale in a place." Is there not evidence before us every day that an officer with functions as last described might very well be usefully employed even now?

The method of street cleansing at present carried out in St. Pancras is to turn out the horse brooms, with water-carts before them if need be in dusty weather, at one a.m., together with sufficient men to direct their route, as the drivers of the machines are supplied by the contractors. At six o'clock the whole of the Vestry's scavenging staff turns out and proceeds to heap up the ridges of material swept to the sides of the road by the machines, and to remove this material entirely from crossings and intersections. Soon after six o'clock the vans arrive to pick up the material, and with each van one of the Vestry's sweepers assists the driver, who shovels up the material while the sweeper draws it together and cleans up with his broom. Main lines of thoroughfare are of course dealt with first, and the work proceeds in a similar manner throughout the day.

In the main streets, and more generally during the periods of *heavy slop*, the larger number of our sweepers are working in

from six to twelve men, and the remainder are
ingly, each having a certain number of streets or
street to keep in order.

ft entirely to the contractor to find the best means of
of the material he collects. The drier portion from
nd from granite and wood-paved roads can be sold as
the gritty stuff from Macadam roads, containing but a
ortion of the droppings, is in some cases used to temper
rickmaking, the remainder is shot to waste where an
ailable. When wet slop is collected it has to be banked
ft to drain until it can be worked with the shovel,
sent to shoot either by canal or rail. In one or two
he slop is washed in a mill, and the clean grit is
for further use, either for mortar-making or for
e roads again.

me ago I made a series of observations to compare the
ing a given amount of work by horse-brooms and by
ur, with the object also of comparing the relative
which the work was done. I found that one machine
le of doing a given quantity of work in the same time
r the same general conditions as fourteen men, and
ve cost of the work by the machine and by hand
s as one to two-and-a-half.

are certain conditions of weather, such as continued
ather, when the condition of the material on the
o sticky that it is not possible to remove it effec-
her by hand or by horse brooms, and in the course
days a considerable quantity of greasy mud will
e on the roads, and the only way to remove it was
g—and this practice has been occasionally adopted
years. About 12 months ago the process was ex-
der more regular conditions, and observations were
o the extent and cost of the work with the view of
g whether it would be beneficial to apply it over a
mber of streets in the Parish, but in view of the cost
ion was decided upon. The manner in which the
done was as follows: The water vans first traversed
two or three times and then the horse brooms followed,
ial was then worked into a fairly flowing condition, and
d to the sides of the road, the slop vans in attendance
nce loaded, and the whole of it removed to a shoot.
ds the water vans again traversed the road, being fol-
the scavengers using rubber squeegees and brooms,
ng the whole of the material which was then found
ad to the gullies. In this manner a gang of eight
water vans and horse brooms effectually cleansed an

area of about 25,000 sq. yards during a night's work, everything being finished before 9 a.m.

The cost of course varies with the character of the road, and I have found that in a road paved with hard wood in good condition the cost was 3¾d. per hundred sup. yds. per time; whereas a road paved with granite sets in fairly good condition costs 10d. per hundred sup. yds. per time. I am unable to give comparative figures for washing asphalte, as we have so little of that material in our streets.

The washing which is done in the City nightly is done entirely by hose and as the surface is all of asphalte there is nothing like the quantity of material to be removed, nor is there the same labour in obtaining a clean surface.

The same process of washing by hose is adopted, I know in several other districts in London, but it can only be made use of where stand pipes are fixed at sufficiently close intervals so as to make the lengths of hose that are necessary not more than about 40 yards.

In making a comparison between hose washing and van washing I find that the quantity of water used with hose washing was considerably greater than with van washing. In the former case two-fifths of the total cost was for water, as against one-seventh in the latter. This proportion may be taken as being slightly more than two to one. The cost of washing Oxford Street by water vans is stated to be 9d. per hundred sup. yds. per time, and that of washing the Strand by hose as 3¼d.

It might be expected where streets have been paved to a very even surface with wood or asphalte that they should be kept much cleaner than they are, but the difficulty is that not only is mud produced by the droppings on any particular street under observation, from the sanding that it receives to reduce slipperiness, and from the refuse turned out upon it from adjoining premises, but there is also a large amount of dirt from adjoining streets transferred by the wheels of vehicles; and in any wide-jointed paving, such as granite sets, it is surprising what an amount of mud may be retained in the joints after the surface has been as effectually cleansed as ordinary processes can make it, for as soon as traffic begins to run over a road just swept, horses' feet and wheels at once begin to disturb the mud from the joints, and it soon appears as untidy as if nothing had been done to clear it.

We do not keep a record of the cost of cleansing, or quantity of material removed from the different classes of pavement, but it is obvious that macadam must head the list; next to that I think granite paving must be placed, especially where tramways for the independent gravelling by the Companies, in o the tramway traffic, adds largely to the products of g. Very close after this comes soft wood, the disin- of which is very rapid, and the spongy nature of its ssists to accumulate mud. Then I should place hard ing at a considerable distance below soft wood, for if h close joints its surface is almost impervious and it is ned. The material which I regard as costing least ng is asphalte, but it is surprising how little slop on is necessary to secure splashing. House and shop ar witness of this, and a trotting horse distributes a ray over an extensive area.

t feel disposed to suggest the special suitability of any avement for London streets; each has its advantages its disadvantages. For instance, macadam involves in first construction, and for roads under light traffic ntial neighbourhood it is not likely to be ousted for a ; granite paving is the most durable and economical avy traffic, but it is very noisy; wood pavement of nber is the quietest under traffic, but its life is short tenance costly; the Australian hardwoods are not so he last named, but are more durable, practically non- , and more easily cleansed; asphalte is not so silent as ng to the loud pat of the horses' feet; it affords a very us foothold except when quite wet or quite dry, but it leansed.

per on "The Sanitary Aspects of Wood Pavements," X. of the Journal of the Institute, p. 94, Mr. Mason ibed more in detail the methods of treatment of wood node of paving the blocks, so that I need not traverse ground.

case of a snowfall which does not immediately melt on rrangements are made to divert the whole of the or- aff of the Vestry, not only those engaged in sweeping, workmen in other branches, to take in hand the clear- he streets from snow; and employment is also given to le-bodied man who applies at the depôts, where he is l with a suitable tool; and after being formed into aced under the direction of one or more of the Vestry's men, the gangs are distributed throughout the main the Parish to clear, first, the footways; then the car- s, bringing the snow into heaps parallel with the which is kept open to allow the escape of the water melting snow; then if it does not melt freely carts are d to remove it to certain manholes communicating with sewers, which have in them a sufficiently large flow of water to carry away the snow as it is shot into them. At each of these shoots flushers are stationed in the sewers to break up the snow and see that it passes away with the water.

To prevent any appreciable quantity of grit being transferred to the sewers with the snow, it is the practice to shoot the snow into the sewers only so long as it remains fairly clean and can be shovelled. As soon as it becomes slop, then the slop contractor is required to remove it to shoot as ordinary road slop.

On the occasion of the snowfall in January, 1895, we had on several days 1,000 men or more engaged in the removal of snow, the largest number in any one day being 1,098 and the total cost incurred in removing that snowfall amounted to £2,472.

When frost occurs before the snow is removed from the streets, the influence of traffic together with the frost causes it to become firmly attached to the surface, then the only method of removing it is by thawing it with salt. When it becomes necessary to use salt it is spread late at night, and every endeavour is made to get the streets where it has been used cleared and washed by 9 o'clock the next morning.

During the winter of 1896–7 a machine was brought to my notice for which it was claimed that it would melt the snow shovelled into a tank forming the body of the machine as quickly as it could ordinarily be filled from the heaps along the side of the street. The machine had something the appearance of a water van. It had a double bottom, between which there were three oil spray lamps intended to maintain a sufficient temperature in the water tank above, so that snow being filled into the tank would quickly melt and pass away by the overflow as water, or it could be retained until a gully was reached and a certain quantity run off.

Several attempts were made to prove the capacity of this machine, but it was found that the temperature of the water so quickly ran down on snow being thrown in, that the filling had to be discontinued after putting in about two cubic yards, so as to allow the temperature of the water to be raised again. Repeated experiment showed that it took about one hour five minutes to melt two cubic yards of snow, and to raise the temperature of the water to that at which the operation started, say 210 degrees. The cost of working the machine was found to amount to about two and a half times the cost of carting the same quantity of snow to a sewer shoot.

The very rapid diminution of temperature after the snow was first thrown in was of course due to the enormous capacity for heat possessed by the snow. To reduce snow or ice to

a temperature, say only one degree higher, requires
ation of about 174° F.

gh I have shown that some endeavour has been made,
ıbtedly with some success, to improve the cleanliness
eets, they are still admittedly very dirty in certain
of the weather, and it is a question upon which I
opinion of this meeting whether it is not reasonable
at the provisions contained in Public Statutes still
on the Statute Book, which were drawn with the
securing the tidiness of our public streets, should not
rigidly enforced; in fact, they are not at present
ıt all.

llowing provisions are contained in the Metropolitan
t of 1839:—

Prohibition of other Nuisances.

. Every person who, in any street or public place
thin the limits of the Metropolitan Police District,
ıll be guilty of any of the following offences, shall
liable to a penalty of not more than 40s. for every
:h offence (that is to say):—

Rubbish

ery person who shall throw or lay in any thoroughfare
y coals, stones, slates, shales, lime, bricks, timber, iron,
other materials (except building materials, or rubbish
ereby occasioned, which shall be placed or inclosed so
to prevent any mischief happening to passengers):

Beating Carpets.

Rubbish in Drains, &c.

Sawdust in Frost, &c.

ery person who in any thoroughfare shall beat or
ake any carpet, rug, or mat (except door mats before
e hour of eight in the morning), or throw or lay any
rt, litter, or ashes, or any carrion, fish, offal, or rubbish,
throw or cause any such thing to fall into any sewer,
pe, or drain, or into any well, stream, or water-course,
nd, or reservoir for water, or cause any offensive
atter to run from any manufactory, brewery, slaughter-
ouse, butcher's shop, or dunghill, into any thoroughfare
any uncovered place, whether or not surrounded by a
all or fence; but it shall not be deemed an offence to
y sand or other materials in any thoroughfare in time
frost to prevent accidents, or litter, or other materials
prevent the freezing of water in pipes, or in case of
ckness to prevent noise, if the party laying such things
ıall cause them to be removed as soon as the occasion
r them shall cease.

er provisions were included in the Metropolis Manage-
t of 1855, but by the Public Health (London) Act,
ıey were repealed and the following Sections were
ed.

Extract from the Public Health (London) Act, 1891.

Removal of Refuse:

Removal of Refuse.

Duty of Sanitary Authority to clean streets

29. (1) It shall be the duty of every sanitary authority to keep the streets of their district, which are repairable by the inhabitants at large, including the footways, properly swept and cleansed so far as is reasonably practicable, and to collect and remove from the said streets, so far as is reasonably practicable, all street refuse.

(2) If any such street in the district of any sanitary authority, including the footway, is not properly swept and cleansed, or the street refuse is not collected and removed from any such street, so far as is reasonably practicable, as required by this section, the sanitary authority shall be liable to a fine not exceeding twenty pounds.

(3) So much of any Act as requires the occupier or owner of any premises in London to cause the footways and watercourses adjoining the premises to be swept and cleansed is hereby repealed.

* * * * * * *

Sanitary Authority to appoint Scavengers.

31. Every sanitary authority shall employ a sufficient number of scavengers, or contract with any scavengers, whether a company or individuals, for the execution of the duties of the sanitary authority under this Act with respect to the sweeping and cleansing of the several streets within their district, and the collection and removal of street refuse and house refuse, and the cleansing out and emptying of ashpits, earth closets, privies and cesspools.

Disposal of Refuse

32. All street refuse and house refuse collected by or on behalf of the sanitary authority shall be the property of that authority, and the authority shall have full power to sell and dispose of the same for the purposes of this Act as they may think proper, and the person purchasing the same shall have full power to take, carry away, and dispose of the same for his own use, and the money arising from the sale thereof shall be applied towards defraying the expenses of the execution of this Act.

Owners, &c., to pay for removal of refuse of trades.

33. (1) If the sanitary authority are required by the owner or occupier of any premises to remove any trade refuse that authority shall do so, and the owner or occupier shall pay to that authority a reasonable sum for such removal, and such sum, in case of dispute, shall be settled by the order of a petty sessional court.

any dispute or difference of opinion arises between
owner or occupier and the sanitary authority as to
it is to be considered as trade refuse, a petty sessional
rt, on complaint made by either party, may by order
rmine whether the subject matter of dispute is or is
trade refuse, and the decision of that court shall be
l.

* * * * * * *

. Interpretations.—

he expression "Trade refuse" means the refuse of
trade, manufacture, or business, or of any building
erials.

he expression "Street refuse" means dust, dirt, rub-
, mud, road-scrapings, ice, snow, and filth.

expression "House refuse" means ashes, cinders,
ze, rubbish, night-soil, and filth, but does not include
le refuse.

on "Street Cleansing in Europe," prepared by the
ner of Street Cleansing, City of New York, was
last year in the "Public Health Engineer," and one
luding paragraphs is of such interest that I venture
.

d from "Street Cleansing in Europe," a report by
. E. Waring, Commissioner of Street Cleansing,
v York ("The Public Health Engineer," Sept. 2nd,
9, page 190.)

iewing the whole subject of European Street Cleans-
ame under my observation, the most important and
consideration is that which concerns the relation of
to the work, and, largely as leading to that, the
which the police intervene to prevent the littering
eets. The regulations in European towns are no
n ours. The laws and ordinances are substantially
ut there is the immense difference that in Europe
ordinances mean something and are executed, while
re treated as mere matters of form. The policeman
ould as soon think of letting a highwayman escape
and official attention as of disregarding a man who
y threw littering material into the street. I have
men in Europe accost gentlemen, apparently foreign-
litely but effectually request them to pick up a paper
hrown away. I have seen policemen in New York—
pectacle is observable at every turn—saunter in a
nanner past a crowd of littering people, utterly un-

conscious of the fact that they were violating any rule or regulation, and apparently considering it beneath the dignity of their position to heed the suggestion of a citizen that they were not obeying their orders. Here lies, unquestionably, the great secret of the difference between our ways and European ways.

"As to the methods available for the improvement of the New York System very little was observed. As a rule our carts are better than theirs, being lighter and tighter; our brooms are probably better, and our methods of final disposition are quite as good, owing no doubt to our much better conditions for dumping refuse. Indeed the only country in which important differences were found was Austria. The method of separating wastes at the point of final disposition in operation at Budapest was suggestive of very important improvements available here. So in Vienna I found the best street sweeping machine, the best sprinkling cart, and the best snow plough. All of these will be tried here and adopted if found sufficiently better than what we are now using.

"Another matter of special interest to New Yorkers is that our system of street sprinkling is entirely unique. So far as I could learn the world has never before conceived of such a method—where only that part of the street lying in front of property whose owner pays the contractor a sprinkling rate gets any sprinkling whatever, and where the volume of water used is regulated by the sweet will of the driver, without restraint from any official authority. In Europe street sprinkling is always under the control of the authority by which street cleansing is regulated. It is a necessary and inseparable part of the same work. There is a proposition now before our Legislature to extend and to increase the street sprinkling monopoly in this city. I trust that the people will insist on the defeat of this measure, and so avoid the further tying-up of their interests in this respect with the financial interests of a street drenching company with a pull as at present. There is no more reason for farming out the work of sprinkling the streets than that of sweeping them. Both are functions of municipal authorities, and should be kept under close control."

There are many of the details of the report that are also interesting, but in speaking of the street cleansing in London the practice of the City only is mentioned, and it will be recognised that the conditions which apply to the City are by no means applicable to the whole of London, nor are the methods of the City any more applicable. He says that the general appearance of the streets of London as to cleanliness is much the same as that in New York so far as its more important thoroughfares are concerned. There is about the same amount ng with paper and other refuse. The less important hich are swept two or three times a week are not as ours which are swept at least once a day, but the f such streets in London is much better. Of Bir- he speaks in terms of high eulogy as offering "to the f municipal administration a perfection of system of completeness, and of economy which, if his standards n formed in America, is simply amazing. Such will never be possible here so long as 'politics' have whatever to do with our municipal administration." udes his reference to Birmingham as follows:—"The on to be learned from Birmingham—and its methods icated in English towns generally—is the lesson of ical, non-shirking, and non-poor-man-coddling business ent of public affairs. It shows us that a department works should not be a department of charities, and de from proper and generous public charity—the the taxpayer should be used with the same care and that are so imperatively necessary to the successful ent of private works."

nparing the cost of the work as done in European th New York enormous discrepancies exist, but this ntly largely due to the differences in wages. In or instance, a sweeper works ten hours for 1s. 8¾d.; York a man gets 9s. 7d. for eight hours' work. A verage streets in New York costs, without including ment of snow, £1,495 10s. 0d. per annum, or very x times what I find it costs in London; and if St. were to spend an equivalent sum on its eighty-six streets it would add 1s. 8d. in the £ to the rates, doubtless to provoke a revolution in local government.

f the principal difficulties is to secure the removal of on as it is put together, and there are limits to the n with which a Contractor may reasonably be called emove the material in times of excessively heavy work, ather producing wet slop not only is the cubic quantity ly increased, but the available capacity of the vans is as what can be carried heaped up on one van when possibly fill six vans when entirely fluid, when loaded may be safely done without splashing over; and even something less than full, is much heavier on the horse ble the bulk during dry weather.

76 a machine was purchased by the Vestry of St. designed to sweep the road, elevate the material by scrapers working in confined shoots discharging into a or cart attached to the rear of the machine. The idea

was good no doubt, but difficulties arose in removing the attached carts, sending them to shoot, and replacing them with empty carts as quickly as was necessary to keep the machine going, and further in sticky weather a machine intended to be drawn by one horse required three to move it. The brush moreover was of much narrower width than the brooms now used and it was found that neither expedition nor economy resulted from its use.

At a meeting of the Association of Cleansing Superintendents of Great Britain held in Glasgow last September, a paper was read by Mr. E. Shrapnell Smith, the Hon. Sec. of the Liverpool Self-Propelled Traffic Association, in which he advocates the adoption of mechanical power in substitution for horse traction, and he promises that in the matter of street cleansing machinery, economy by the alteration is certain. He submits not only argument and description but also facts as to the cost ascertained by the official trials held in Liverpool last summer, of the various self-propelling vehicles submitted in competition. He concludes with the experience of Chiswick, Chelsea, Leyton, Battersea, Camberwell and Liverpool, as showing results exceeding his previous estimate of economy. I have only within the last few days come across this paper, and am very much impressed by the prospect it holds out to us, and I fully intend to go farther into the question to consider its applicability to my own district.

So long as horse traction continues we shall be unable to keep our streets in a condition which will escape complaint, for besides the droppings distributed continually, there is also the alternate gravelling and watering, the latter natural or artificial, necessary to prevent the slipperiness or to lay the dust. The grinding up of all these by passing wheels ensures plenty of work for the scavenger, and until motor traffic has become general I fear that no material improvement in the cleansing of our streets coming within a reasonable limit of cost can be secured. Even now I do not think we fall far short of the requirements of the Statute that our streets shall be swept and cleansed so far as is reasonably practicable.

The CHAIRMAN (Mr. H. Percy Boulnois) said they would all agree that the paper had shown in a practical way the difficulties connected with the question of keeping the streets of the metropolis clean. The title of the paper however, judging from its contents, should have read, "The Insanitary condition or otherwise of London streets," because Mr. Blair did not accuse the London streets of being bad. Personally, he thought that, on the whole, the metropolis it was governed by most of the vestries, would compare urably with the condition of provincial cities. Some of the r. Blair had dealt with were important as, for instance, the t of street cleansing in St. Pancras, which in 1891 cost at f £200 per mile, whereas in 1894 in was raised to £280 per is showed that St. Pancras, at all events, had been alive to , and that it was spending more and more money in this ssary work. At this rate the cleansing of the 1,983 miles in the metropolis would be considerably over half a million scavenging alone, which was a very large figure; and on the had given in regard to the removal of snow, a fall of snow n, if completely removed in the way he described, would £300,000. This would seem to be a mere waste of money. had rightly been directed also to the importance of he streets, which no doubt had become possible owing to luction of hard pavements instead of old macadam roads. , he had tried it, and agreed with Mr. Blair that washing s would eventually be the way in which they would be universally cleansed. Washing required an unlimited water, and it must be in the hands of the surveyor of the say how much water he needed. The only way in which could be washed was by hose under pressure, because it him that washing by cart merely seemed to be adding the mud on the roads, and then sweeping it away. His was that the mud should be washed into the sewer with with, of course, a little brooming to back it up. In that economy would be obtained. He agreed with Mr. Blair istance of the stand pipes from each other should not be forty yards, and with regard to the list of pavements as specially suitable for London streets he could cordially e order in which they had been given. The way in which ned them too on sanitary grounds was also perfectly Asphalt, unquestionably, was the best sanitary pavement. had dealt with the question of snow, and there was no doubt vy fall of snow cost a large amount of money if it were moved. In Liverpool an ordinary fall of snow generally £3,000 to £7,000 Latterly they had introduced into Liverpool of washing the snow directly into the sewers without to carry it away, and that had proved extremely satis- It had been necessary, previous to washing it into the thorougly salt it. If they attempted to wash snow in its ondition, it would begin to freeze and could not be moved; application of salt, in two or three hours, it was got into ndition that the application of the hose washed it away. ple regarded this question of salting as an important one, made the streets exceedingly unhealthy, besides being bad rses' legs, and detrimental to people who were badly shod. regard to the horses' legs, that could be got over by oiling to the fetlocks. Of course, the other matter was more get over, but he thought it was better to have a temporary inconvenience of that kind rather than that they should have the snow lying about for a considerable period. The method of melting snow, to which the author had drawn attention, was, of course, perfectly wrong. The inventor had forgotten the amount of latent heat in snow which had to be overcome. To understand this, if they put a saucepan full of snow on the fire, they would be surprised at the long time it took to melt. With regard to the provisions of the Police Act, 1839, which appeared to have been repealed by the Public Health (London) Act of 1891, in regard to the particular section dealing with the cleansing of the foot paths, Mr. Blair thought that old section ought to be put back again, casting the duty on the occupier on the premises. Speaking as a householder, personally he should not like it put back, because he thought it was a difficult thing for householders to find anyone to clean the front of their premises, especially after a fall of snow. It was true such labour could be obtained, but it was the sort of labour which was very impudent and exacting, probably ending with a row. With all due deference to Mr. Blair, speaking as a citizen of London, he felt that the vestry had appliances and labour to undertake this work, and it was just the same whether the householder paid for it being done direct, or paid for it through the rates. Then, with regard to the report of Col. Waring, he thought that New York showed us how not to do it. They need not go to New York to learn lessons in regard to the paving and cleansing of streets, and he did not believe we could learn anything from them in the way of municipal government. In concluding, Mr. Blair referred to the opinions of Mr. Shrapnell Smith, who was to have been present that evening, in regard to the question of motor traffic. Mr. Smith was very sanguine that he would be able to introduce motor traffic or action into street cleansing. It was to be hoped he would be able to do so. It was quite possible, but from his (the Chairman's) experience of motor cars, unless they were able to do away with the terrific nuisance of smell, he thought they had better not have fresh mechanical sweepers in their streets. There were two other points to which he should like to call attention in reference to street cleanliness, and that was the distribution and collection of shop refuse. No doubt the streets were to a great extent in the condition they were, owing to the reprehensible practice of bringing out the shop refuse, not only sweeping it out, but placing it in very improper receptacles waiting for the scavenger's carts to come up. He thought the local authorities ought to be compelled to provide suitable receptacles along the sides of the streets for the reception of this refuse and that the traders should be compelled to place their refuse in those receptacles by six or seven o'clock in the morning, so that they could be removed in good time and before the pedestrian traffic became great. This was an abominable practice of tradesmen, and he considered it ought to be stopped. Another cause for the bad condition in which our streets in London existed was the number of dogs which were kept in the houses. He did not think that a dog ought to be kept in a town at all. Another habit which made ets far from what they ought to be was the filthy habit of ating on the foot-paths; some day he hoped that a law would d, making it a punishable offence for anyone to expectorate ublic place. However, he thought that they could say that is by no means the dirtiest city in Europe, in fact, he it was one of the cleanest, but at the same time it was of improvement, not only in regard to cleansing, but also in o lighting, for to his view London was the worst lighted city orld.

HIRLEY MURPHY (London) proposed a hearty vote of thanks Blair for his paper, and observed that he thought the attend- t evening was probably very much reduced owing to the con- f the London streets that night. Some efforts were being y the public authorities to cleanse the footways, with the hat they were in the condition everyone present had ex- d that night. With regard to this point, however, it was r to recollect the fact that the Public Health (London) Act, ally drafted, placed that duty of cleansing the footways upon seholder. Mr. Ritchie introduced the bill, and his (the s) recollection of the matter was that the right honourable an's view was entirely adverse to the duty being imposed e sanitary authorities. He resisted the introduction of the se as strongly as he could, and pointed out that the sanitary ies could not possibly be expected to do this work, but such was brought to bear upon him that he had to accept the s it now stands. As to the cleansing of roadways Mr. said his own opinion was that this was inadequate. On a for instance, in various parts of London, the condition of eets was often most unsatisfactory. With respect to the f Col. Waring concerning the condition of New York, ley Murphy remarked that his interpretation of Col. Waring's as that New York was cleaner than London, but anyway ht the condition of London streets was often not that with hey ought to be satisfied. Although the matter was one which be regulated to some extent by money, he thought that the of cleanliness of the streets did not receive all the con- n it ought. He would like Mr. Blair to explain whether the e in the price or cost of paving with different road materials eat as to justify the use of materials that did not lend them- o cleanliness. He confessed to his interest in the cleanli- London streets not depending only on comfort, convenience ncy, although those were large items, but there were reasons king that the cleanliness of the streets in towns stood in bable intimate relation with one malady which is a large death in infants, namely diarrhœa. From that standpoint ght there were many very material reasons for much greater ss than we now have. He was not now speaking of London t of all large towns. Where there were crowds of people ogether, there was a tendency for the roads to get charged with organic matter, and absolute cleanliness of the thoroughfares would probably go a long way towards reducing the infantile diarrhœa death rate. He mentioned this particularly, because it was a matter in which medical officers of health looked to the surveyors to help them in the prevention of disease.

Mr. W. N. **Blair** said, in acknowledgment, he was very much obliged to the company for their vote of thanks, and for the interest they had shown in his paper. Possibly the subject was of more practical concern to surveyors than to those who were engaged in other branches of the Public Health work as, for instance, Mr. Shirley Murphy. With regard to the points raised in the course of the debate, he could agree with the Chairman's suggestion that the title of the paper might have led them to suppose its contents were different to what they were. In fact, to a certain extent, he felt somewhat like the prophet Balaam who was put up to curse Israel, and finished by blessing them. He had been put up to describe the insanitary condition of the London streets, and he concluded by saying that they were not so very insanitary. With respect to Mr. Boulnois' conviction that the ultimate method of cleansing streets would be by washing by hose, it might be remarked that the London County Council would at once prohibit any method of cleansing streets by washing everything into the sewers. They strongly objected to solids being put into the gulleys even now, and the local authorities were required to remove the solids before washing the streets. Washing by water-van was by no means a disadvantage. As much water was added to the road as was necessary to enable the caked stuff to be taken off the road as slop; having had that removed, then the washing process could be proceeded with. He also agreed with the Chairman's suggestion that the condition of the footways is very largely affected by dogs, and by human beings expectorating. Col. Waring mentioned that in some European cities this filthy habit is forbidden by Statute, and it was not an uncommon sight to see persons leave the pavement to expectorate in the carriage way. He was glad Mr. Shirley Murphy disagreed with something in the paper, because it gave him an opportunity of answering. The Doctor disagreed with the last paragraph in which it was stated that London did not fall very far short of the statutory requirements, and he gave an instance where some improvement was desired, particularly referring to the rubbish littering market streets. Whatever might be the case in some places, where the authorities made no arrangement for removing such litter, in St. Pancras they had several streets which were continually used by itinerant traders and costermongers who brought their barrows and stalls for the day, and removed them for the night, leaving the whole of their refuse behind, which refuse consisted of all sorts of animal and vegetable matter. Well, that was dealt with by a large staff of men who were sent out with carts to pick up the material at night, and in certain districts where there was a Sunday morning market, it was also done on Sundays. Special gangs were turned out for the purpose of clearing up this refuse, and ently through the last twelve months had had a spin round ict on his bicycle, to see whether the work was satisfactorily Sunday mornings before church. He never had reason to ', for so far as he could see it was always properly cleared e ten o'clock on Sunday morning. One very important point ed to which he was pleased to reply, and that is as to the ıst of paving, and as to whether that affected the decision as loption, having special regard to the question of cleansing. ry was distinctly of opinion that it is wise to incur the ost of permanent and impervious road material whenever nstruction of a road in a dirty neighbourhood comes under ation. During the last eight or ten years they had pulled up macadam roads in the narrow poor streets, and relaid those th granite sets, and these were grouted with pitch, thereby an absolutely impervious paving; the road could not then those vapours which are so often the cause of trouble. But tted to say in this respect the vestry was not followed by its for instance, the London County Council was recommend- construction of a new street in a district which might be o some of them by reputation, namely Somers Town, and it osed to make a carriage way of macadam. The vestry pro- ainst it, and pointed out that where they had relaid a street neighbourhood, they had always paved with stone. The County Council declined to undertake the cost of paving. in this respect the Vestry might have the assistance of Mr. Murphy in obtaining some reconsideration of that decision. rs, generally, he thought were alive to the importance of the e they could render in matters of public health, and he did k one could reasonably find fault with them for any neglect public duty, either in regard to street construction, or as to nd their ventilation, all of which came within the duties and he attention of their surveyors. They were utilising every nity to secure improvements in these matters, not altogether, ght, without success. The general mortality is declining ably, and although he did not claim that this was entirely the improvements in the particulars referred to, of course ıst have their effect. It was to be remembered that the mortality figures were materially affected by the overcrowding nitary condition of houses, and that was a matter over which eyor had no control, it was distinctly within the province of ical officer of health; but at the same time they were all alive ery great importance of the whole question with which they en concerned.

GENERAL CONCLUSIONS

DERIVED FROM THE EXPERIMENTAL BACTERIAL TREATMENT OF RAW SEWAGE AT THE OUTFALLS OF THE LONDON SEWAGE INTO THE THAMES.

By Prof. FRANK CLOWES, D.Sc., F.I.C.

Remarks introducing Discussion at Sessional Meeting, March 14th, 1900.

Note.—The paper was illustrated with lantern slides prepared by Dr. Houston.

The following results were obtained by treating raw sewage bacterially in coke-beds.

1. The sewage was allowed to flow into large tanks which contained fragments of coke about the size of walnuts. As soon as the level of the liquid had reached the upper surface of the coke-bed, its further inflow was stopped, and it was allowed to remain in contact with the bacteria coke surface for about three hours. It was then allowed to flow slowly away from the bottom of the coke-bed. This out-flowing liquid constituted the "sewage effluent."

After an interval of about seven hours, the processes of filling and emptying the coke-bed were repeated with a fresh portion of sewage. The coke-bed was usually filled in this way twice in every twenty-four hours.

2. A purifying action was produced by the coke-bed. This depends upon the introduction of bacteria from the sewage, and the maintenance of the purifying action is secured by the continuous presence of bacteria or their enzymes upon the coke surfaces, and by the frequently renewed contact of these surfaces with oxygen.

3. The aëration of even the lowest portions of a deep coke-bed seems to be satisfactory in the above method of working, since the air present in the interstices of the coke, between two fillings with sewage, usually contains 75 per cent. of the amount of oxygen present in the air.

4. Raw sewage, which had been deprived of its larger particles by screening it through coarse gratings, lost practically the whole of its suspended matter by remaining in such a coke bacteria bed for two or three hours.

pears that the suspended particles of fæcal matter liquefaction by the bacteria, and do not collect upon ace of the coke.

e sand and grit and finer mud, arising mainly from the road surfaces, however, were deposited upon the coke , and gradually reduced the capacity of the coke-bed.

ir, fibrous matter, woody fibre derived from the wear en street pavements, and particles of chaff and straw derived from the dejecta of horses employed in the raffic, are also deposited upon the coke surfaces and ly choke the coke-bed.

substances, which consist mainly of cellulose, are tly only acted upon by bacteria with extreme slowness he above conditions.

arrive, however, in a water-logged condition, and settle down from the sewage if its rate of flow is

dealing with the sewage of the Metropolis, it seems allow the roughly screened raw sewage to undergo a at rapid process of sedimentation, in order to allow atters (5, 6) to subside; and then to pass the sewage to the coke-beds. The dissolved matters and the small of suspended matters which are still present in the are then readily dealt with by the bacteria of the coke- d practically no choking of the bed occurs.

e sewage effluent from the coke-bed is entirely free fensive odour, and remains inoffensive and odourless ter it has been kept for a month.

clear, except during heavy rain, when a turbidity is d by fine mud particles.

y pond and river fish have been kept in this constantly l effluent for a month, and were found to be perfectly at the end of that period.

he chemical character of this effluent may be briefly d by stating that on an average 51·3 per cent. of the d matter of the original sewage, which is oxidisable by ganate, has been removed by the bacteria, and that the which has been removed is evidently the matter which become rapidly offensive and would rapidly lead to ion of the river water if it were allowed to pass into the

above percentage removal (51·3) was effected by coke- rying from 4 to 6 feet in depth. A similar bed, 13 feet h, has proved more efficient, and has for some time produced a percentage purification of 64 per cent., while an old bed, 6 feet in depth, has given a percentage purification of 86 per cent. A repetition of the treatment of the effluent in a second similar coke-bed has produced an additional purification of 19·3 per cent., giving a total purification of 70·6 per cent.

It should be noted that the above purification is reckoned on the dissolved impurity of the sewage: the suspended solid matter is not taken into account.

10. The bacteriological condition of the effluent corresponds in the main with that of the raw sewage. The total number of bacteria undergoes some reduction in the coke-beds, but the different kinds of bacteria which were present in the sewage are still represented in the effluent.

11. The introduction of such a sewage effluent into the Lower Thames appears to be unobjectionable. The river water at this part is uniformly muddy; it is always brackish and frequently salt to taste, owing to the presence of tidal sea-water. It is, therefore, not capable of being used for drinking purposes.

The effluent will certainly cause no deposit upon the river-bed, and will ordinarily tend to render the muddy river water more clear by mixing with it.

No offensive smell can be emitted by the effluent as it is discharged, and the bacteria which it contains will slowly and inoffensively remove the remaining dissolved organic matter from the effluent after it has been introduced into the river.

The effluent will be suitable for the maintenance in the river of healthy fish-life.

THE CHAIRMAN (Prof. Wm. Ramsay) said they were all very interested in the admirable paper which Professor Clowes had given them, and pointed out, by way of a reminder to those who desired to take part in the discussion, that they were not dealing with effluents which are to be turned into rivers used for drinking purposes. He suggested that that topic should not be touched upon in debate, as the question was large enough without its introduction.

Dr. S. RIDEAL (London) proposed a vote of thanks to Professor Clowes, and said the work which had been done by the author and by his predecessor, Mr. Dibdin, had given them valuable information on this important subject. Professor Clowes had shewn them that it was possible to deal with London sewage effectually by the bacterial process. He, the speaker, remembered coming to a meeting in that

which the subject of the bacterial treatment of sewage was
upon a paper by the late Sir Douglas Galton; the title
taken for that paper was the "Lessons to be learnt from
sachusetts State Board of Health Experiments." That was
and they had a very good discussion. At that time the
treatment, as it is called, was unknown, and was not dealt
ll during the discussion, or, at least, only very incidentally.
time after this paper he, the speaker, among others, was
to advise the Corporation of Exeter as to whether a scheme
s being introduced by Mr. Cameron, the city surveyor—that
wn as the septic tank system—would be of use for the
of the sewage of that town. Dr. Sims Woodhead, Dr.
nd himself, were engaged by the Corporation to examine
they would be led into a wild goose chase as predicted
of its members. Considerable time was spent upon those
ions, and the result was that all the experiments enabled
advise the Corporation that Mr. Cameron's scheme had
merit to warrant it being adopted for the city, situated
on the River Exe, the volume of the river water being
imes that of the sewage. Almost immediately after that
een asked by the council of the Sanitary Institute, to
aper on the subject. In that paper he described fully
now known as the Exeter experiment—the Belle Isle ex-
—and that was about the end of 1896. He had then
at he believed in the bacterial treatment of sewage com-
nd fully, and that the success of any process depended
anaërobic preliminary, such as existed in the septic tank,
y methods of filtration in which plenty of air was introduced
bed. It was a revelation to a good many members of the
and to a good many engineers at that time. He was
at by some for being such a strong advocate of the pro-
fact, people said he was part of the Septic Tank Syndicate
s entirely on behalf of the Corporation of Exeter that he had
ward in the matter, and he did not then know anything of
ence of the Septic Tank Syndicate, in fact, he did not think
then; but any way they all knew that since then there had
od deal of development in what is known as the septic tank
That, however, differed from the experiments which had been
orward that night in the fact that in the septic tank there is
robic preliminary, and the discussion might perhaps be made
resting if he sketched the difference between the two systems,
as afraid that it would take too long. The more he saw of
mittent system of coke beds, such as had been described by
r, the more he felt inclined to adhere to the opinion he had
l originally that some anaërobic preliminary is essential for
f they wish the process to be a bacterial process. Mr. Dibdin
o, it was quite possible to deal in these filter beds with raw
and the Sutton experiment attempted to prove it was
but Mr. Dibdin soon found that it was necessary to remove
s by a revolving screen. Then they had the experiment at

Leeds, in which a similar method was used, and it resulted in diminution in the capacity of the beds, and then they had the Manchester experiment of last year, in which Drs. Percy Frankland and Perkins, with Mr. Baldwin Latham, came to the conclusion that in order to get satisfactory results with these coke beds, such as were originally used in this country by Mr. Dibdin, it was necessary to have a settling in the larger precipitation tanks which the Manchester Corporation have already available, and by locking the sewage in these large precipitation tanks it underwent a preliminary fermentation, anaërobic in character, because the surface of the bed was covered with a felted layer of material, and was an imitation of the septic tank of the Exeter experiment. And that evening Professor Clowes told them most definitely that in order to deal with the London sewage, and to obtain a purification which is suitable for discharging into a river whose water is not to be drunk, it was necessary to remove fragments of the straw, chaff, wood paving, and other matters, which have the effect of diminishing the capacity of the coke bed very considerably if allowed to go on; so that here again they have a confirmation of what he said years ago, that in order to treat sewage successfully with a bacterial process, it is necessary to have a preliminary, and if it is going to be a bacterial preliminary, it must be an anaërobic preliminary, because aërobic processes alone would not deal completely with the solid matters in sewage, especially those which are of vegetable origin. There was one other point to which he should like to draw attention, and that was as to the conclusions arrived at by Professor Clowes from the oxygen consumed test. This test measured the diminution in the amount of the carbonaceous organic matter contained in the liquid. As a test it was one of the best they had for measuring the percentage reduction in the non-nitrogenous organic matter. It was not, however, a measure of the improvement in the condition of the nitrogen in organic liquids, and as this chaff, woody fibre, and cellulose matter, which is retained by the coke bed is carbonaceous in character, and not nitrogenous, its retention by the bed would cause a diminution in the oxygen consumed figure, and therefore account for some of the percentage purification recorded. He did not say it would cause the whole of the improvement, but the absorption or retention of this material by the coke bed causes a diminution in the oxygen consumed figure, and therefore is measured as part of the purification given. Now that was all perfectly true; but it meant only a screening off of the carbonaceous matter, and so putting it into the coke bed instead of into the effluent. What was really wanted was to ascertain what is the percentage purification of the effluent—the liquids in the effluent—and the most important constituent in the liquid is the nitrogen. He should like to see in all these experiments the percentage purification given in terms of nitrogen, or in some way to have the amount of nitrates expressed. In these experiments there was not any intimation as to whether any nitrates were produced by these coke beds or not. Mr. Dibdin some years ago showed that nitrates and nitrites were produced in small quantities. Now the which were well known, such as that of the Col. Ducat Hendon, Mr. Stoddart's filter at Bristol, Mr. Moncrieff's Caterham and other continuous filters, which give a very ate, and these were burning up, or oxidising the liquid, g the ammonia into nitrate, and bringing about a practical of the whole; a diminution of the oxygen consumed figure nt removal of carbonaceous matter. However, he thought very much indebted to Professor Clowes for bringing this efore them, and showing Dr. Houston's excellent plates, d been most skilfully reproduced in the report of the County Council. It had been a pleasure to see them, and glad to be able to move a vote of thanks to Professor r his interesting paper.

. H. Collins (London) seconded the motion, and said that of gratitude could enable him to express the views of the towards Professor Clowes he could do it to a very large In saying he knew nothing of the subject he was probably ing what the professors themselves seemed to think about tion. He was old enough to recollect how some thirty years sums of money had been wasted in the endeavour to solve age problems. It had been suggested that it was a barbaric o put the sewage into the sea, or into the rivers, and it had tended that the only proper way to treat it was to throw it land. The history of these attempts had contributed a great of literature to the subject, sufficient to fill a large library. ersons, he knew, had contended that fortunes were to be this method, and by that method, and he had visited many ies and seen the enormous sums of money which had been l at the ratepayers' expense on these various projects. He the authors of these schemes had been actuated by the best es, and the greatest intelligence, but unfortunately their ex- ts proved unable to develop into practical purpose. No doubt ed a great debt of gratitude to the London County Council, and gentlemen engaged in trying to solve this problem by experi- n something like a practical scale, but it was to be hoped it ot cost the ratepayers too much money. At the present time eter was sceptical as to the practical positive results of the l process; and it was to be hoped that in anything that was th the new system, it would not be taken up in the haphazard at was the case with some of the earlier experiments. If ofessor Clowes stated was correct, then the London County for a great number of years must have been very unneces- pending large sums of the ratepayers' money, seeing that it ly necessary to pick a hole in the ground, put some coke in, sewage in, run it out, and obtain a remarkably good effluent, architect he had been obliged to spend very large sums of too, and consult men like Mr. Baldwin Latham to assist him ulties with which he had been surrounded; but if one could er this sewage problem in this easy way, the profession of which he was a member would doubtless owe a great deal to gentlemen like Professor Clowes and Dr. Houston, for their experimental work in sewage treatment. It had occurred to him however, that in a manufacturing town like Manchester, or other places that could be mentioned, a difficulty might arise in treating sewage by means of the bacterial process, because of the waste chemical products which were discharged so copiously into the sewers. It was a point to be considered how far that process was likely to be thus affected.

Mr. W. J. DIBDIN (London) said that although he had not heard the whole of the paper, he could gather some idea as to its contents by the exceedingly valuable reports of Prof. Clowes to the London County Council. Perhaps he had been able to follow those investigations more closely as they had been so well and admirably continued on the results of his former work in this direction, both at Barking and at Crossness, as well as at Sutton, and at many other places. He could fully endorse the observations as to the results at which Prof. Clowes had arrived. There was no question now that the problem had been completely solved—namely, that purification of foul organic matters could be accomplished by the action of living organisms. That was an established fact and now generally admitted. Whether certain details in the method of applying this principle were the best, or whether other details were better, he thought for the present purpose they could leave that matter alone. There were plenty of engineers who were paying close attention to the question, and who were now gaining practical experience in all parts of the country with different classes of sewage, and who in the course of their experience would be definitely able to answer the question as to the particular modification of the process which may be the best for any particular circumstances. It was necessary that the question should be approached carefully in every case with regard to the character of the organic matter which had to be treated. The last speaker touched upon a very crucial point, how the process of bacterial treatment can be applied successfully to the purification of foul waters containing manufacturing refuse. That was a point upon which they could now safely say they had a good deal of information. Foul waters containing refuse from breweries and tanneries, or the premises of leather dressers and other manufactories of the kind, were now being successfully purified solely by the aid of living organisms, and the results had been entirely satisfactory. One of the most successful cases was that of Yeovil, where for some two or three years past a certain portion of the sewage of Yeovil, which contains very large quantities of tannin and leather dressers' refuse, and is very foul, had been successfully treated by combining the anaërobic and the aërobic processes. The sewage was put into a septic tank devised by Mr. Cameron, of Exeter. Then the effluent from that passed on to the coarse bed or filter—he preferred to call it a bacteria bed because the word "filter" was a misnomer in that connection—and from that it went on to a second final bed, with the result that the effluent was entirely satisfactory. In other case refuse had been dealt with in a similar successful manner. :t of the treatment in the second bed was to render the sewage sweet, and to make the effluent of such a character that ıe summer months it could be safely discharged into a small ditch. In the particular case he had in view, all the ›s, including the Thames Conservancy, and the residents ıeighbourhood, were perfectly satisfied. At Leeds there ;e quantities of liquor from the Copper works, and this ıtained a quantity of sulphate of iron. This was a strong : and most deterrent to bacterial growth, but even in that ›ewage had been most successfully treated. One point dealt Professor Clowes which the Leeds experiment had brought clearly, was that the danger to be avoided was what was r called the "choking of the beds," namely the accumulation ı detritus which gradually filled up the pores of the bed, the water capacity. The remedy for this was to sift out the ›rs leaving the coarse. Such matters as woody fibre, and all ıatters of that kind which were resistent to the action of should be first of all removed. This necessitated the ry introduction of a grit chamber, or the use of the septic ome settling chamber, in which these resisting particles were ıll settled, after which the true sewage, or fæcal matter, conveyed direct on to the beds. An arrangement of this Professor Clowes had shown, led to complete purification, he additional advantage of not interfering with the water ›f the beds, or, in other words, that they would continue to vork for long periods of time without any alteration. There ıy other points involved in this question, and he trusted the ırks he had made would not be taken to cover the whole The subject was too large to be adequately dealt with in ıited space of time as they had at their disposal. Several had arisen as to the best method of distributing the sewage ed, and many ingenious devices had been forthcoming for ›rs in the way of sprinklers, channels, and so forth. They ıodifications of the same principle to be kept in view, and ı in the course of time would be enabled by their experience ıich particular modification might be the best; but circum- ıust be taken into account, as in certain conditions of locality rth, one particular modification might be more suitable than The experience which would be gained in various parts of try would be able to indicate which was the best mechanical ıce. The point before them at that moment was the principle that foul organic matters can be and are effectually ›y the action of living organisms in the sewage. It was to mbered that there were millions of these bacteria in the t the start, and what they had to do was to cultivate them v them to increase, so that they could feed upon and destroy ınic matter, effectually bringing about purification. One ›int he desired to touch upon, and that was a point which ıot be overlooked, namely the character of the effluent in regard to agriculture. The bacterial process would leave the essential qualities in the sewage from a manurial point of view, namely the phosphoric acid and the potash. The nitrogen of the sewage was largely converted into nitrates, and so a certain proportion was available for manure. No doubt the effluent from the bacterial process could be used for farm purposes, and it possessed this additional advantage that when it was desirable that land should not be over flooded with water, the effluent could be discharged in another direction. As a practical instance of what could be done in this direction, there were the Sutton beds; formerly the land did not pay, but last season they had a return of £27 per acre from peppermint, and at the same time the whole difficulty of their sewage treatment was obviated. In the case of London sewage it would be out of the question to adopt any system of irrigation with a view to profitable farming because the enormous volume to be dealt with, something like 220,000,000 gallons per day, constituted a physical difficulty not to be overlooked. Without going into the matter deeply, he might refer to the important bearing which the question raised in regard to the cultivation of our wheat fields. No doubt, as some scientific investigators had insisted, by turning our sewage effluents into the rivers and sea, we were wasting valuable manures. The question too also had some relation to the fish supply, and undoubtedly by discharging a pure effluent into the rivers, instead of a foul one, we were doing something towards preserving the river fish. This was particularly so in the case of the Thames which now supported fish life, while a few years ago it was altogether out of the question. They had secured their object of preventing the River Thames becoming a nuisance to the community and a danger to health, and with the advance of knowledge they would be able to adopt improvements which would bring about a great increase in commercial industries and the wealth of London.

Mr. ARCHIBALD (London) remarked that he had read the excellent reports of Prof. Clowes to the London County Council with great interest. With regard to the typical treatment that had been spoken of, whatever the results might be, he thought it would be advisable that the conclusions drawn should not generalise as regards chemical treatment, since the results obtained very much depended upon the class of chemical treatment used. Looking at the figures which had been given them, he could say that he knew of a chemical treatment which yielded vastly better results. He particularly wished to draw attention to the fact that if chemical treatment is adequate they could get quite as great a degree of purification as was estimated by the method of double filtration through those filters. Quoting from some of the reports of Prof. Clowes the speaker pointed out that some choking did occur, and said that all that they as investigators required was the truth in regard to these matters. In many ways chemical treatment had been rather unduly underestimated, and this might be owing to the fact that in most places where experiments had been made, the system had not been ly carried out. The object of the towns taking it up was to ing as cheaply as possible, and if the system had been carried proper manner, undoubtedly the chemical tank effluents ve come out much better than in most cases they had done. sy to understand that towns would rush into the bacterial cause they thought it was a happy way out of their difficulties. l to promise that they could do it for next to nothing, but e if they had properly dealt with a chemical system, that ould not have been so quickly thrust aside in favour of the thod. Had chemical systems been properly carried out, he he results would have been as good as they could desire. s rush into the bacterial method had subsided, he believed d find that previous chemical treatment on an adequate scale le of producing an effluent which, with one filtration, would ut a better result on the whole than if the bacterial principle ted from beginning to end. Most of the sewages he had with by the bacterial system were not strong ones, and the per cent. was therefore not large, whereas in the case of a ng sewage they might require three or four filters before l obtain an effluent which would comply with the standards. that might be, he should like to thank Prof. Clowes for his Ie might mention that the chemical method he had in his olved the application of fifty grains per gallon, and this nvey an idea of the scale on which the material was added uld produce the better effects he had suggested.

EDK. J. OSBORNE SMITH (London) asked Prof. Clowes to be igh to say whether the soap and grease in sewage had any n the bacterial process. He should also like to know if any benefit derived from the action of the sun. In two had been connected with, in the one which was open, the top was covered with soap and a kind of sludge, the as infinitely better than from the one which was enclosed, ut any scum upon it.

S. E. ACKERMANN (London) asked Dr. Clowes what was the value of the effluent compared with the raw sewage. The l an idea that an effluent from a bacterial system was of no value. So far as the encouragement of fish life was , he understood that the fish could not feed upon the om a bacterial system, but that the effluent merely acted in e kind of way, doing no harm, and allowing the fish to l multiply.

. DENNIS (Aldershot) gave some particulars of what had been ldershot with experiments both as regarded Mr. Cameron's nd also with Mr. Dibdin's, with the result that it was d to carry out the latter process. It was to be hoped that e next six months there would be sufficient primary beds atment of the whole of the sewage of Aldershot. So far the analysis had been satisfactory, but they were closely watched by the Thames Conservancy, being above the intakes of the various water companies. It was necessary, therefore, to be very careful in their treatment of the water.

THE CHAIRMAN (Prof. Wm. Ramsay), in summing up the discussion, remarked that his position was one of reserve. He was afraid he could not express such a complete and positive opinion as they had heard that evening. The method which Prof. Clowes adopted appeared to be a mixed method with the effluent running on to very deep tanks—thirteen feet coke beds—and therefore it appeared to him that there must be a symbiotic growth of anaërobic organisms, or a sort of double action if the whole of the nitrogenous matter or a large portion of it were to be destroyed. He should like to ask Prof. Clowes whether in the deep tanks something of this kind did not occur. The percentage of oxygen in the air found at the bottom of the tanks was very nearly normal, but still in the interior of the coke lumps no oxygen would penetrate, so anaërobic action might be going on there. With regard to the waste of matter discharged into the rivers it might interest the audience to know that in Leeds some thousands of tons of metallic iron passed the sewers every year in a state of solution. Personally he would like to hear more about the possibility of an improved chemical treatment before the biological treatment was adopted. It appeared to him that enough attention had not been given to the subject, and no doubt the contention of Mr. Archibald that chemical systems had not been satisfactorily carried out was to some extent correct. If it were possible to recover even a small portion of the sewage in manurial form, it would no doubt give a very great impetus to the whole question. It appeared to him that in spite of all Mr. Dibdin said, they really wasted a large quantity of sewage by pouring it into the rivers, for although a large amount of nitrates and phosphoric acid might be consumed or utilized, no doubt a great deal more ran away to waste. If it were possible to utilize sewage manures by putting them on the land obviously a great deal would be gained.

Prof. CLOWES, at the close of the discussion, remarked that he had always considered that there was mixed aërobic and anaërobic action, both in the coke bed and in the transit of the sewage to the outfall. Undoubtedly the sewage as it arrived did not contain dissolved oxygen, but experiments had shown that dissolved oxygen very soon made its appearance within the coke bed. He did not think the liquid in the interior of each portion of coke underwent anaërobic change, because it was not displaced by other liquid to any large extent. The coke acted really as a sponge which retained the liquid unchanged by other liquid for a very long time. When once the coke was saturated, it remained so. With regard to the remarks of Dr. Rideal he had not counted the cellulose matter in his oxygen-absorbed figure, and had stated most distinctly several times that the sewage they were working with was clarified sewage. None of these containing substances therefore came into account at all, and olved matters of the sewage only were taken into account.

RIDEAL: Then the purification should be much higher really?

CLOWES replied that it was much higher in the return of the calculated on the whole crude sewage. The purification ed to some ninety-two or ninety-four per cent. This point e fully explained in a report to be presented to the London Council. Still for their purpose, the measurement of the d impurity by means of the oxygen-absorbed figure was the actical method. They did not turn their water into the of a river, and they did not care about nitrates or nitrites. hey wanted to estimate was the amount of readily changing matter, and he should be inclined to maintain that this was rly estimated by the amount of oxygen absorbed from perte. The amount of nitrites they got was not sufficient to bly affect the results. They had drawn out curves for albummonia. They had, of course, estimates of their nitrates rites, but under their particular circumstances they were ot to the point, though they might possibly be if the liquid ng to be poured upon land. The question of nitrates thereimportant substances from an agricultural point of view, was sidered by them under their special circumstances. He was to think that the slides had given pleasure; they were the slides of Dr. Houston. He should strongly demur to the on that those who were working in this matter were in a ignorance. Of course, there were matters which they did w, and he supposed this would always be true of science, there would be always something to learn, but yet they had d to this matter learnt a very great deal. They had learned organisms which they were now getting into harness, and use of in the most advantageous way, were contained in ge itself. That was not known at one time. They had also what were good conditions to promote the action of these s. He did not believe, as a matter of fact, that the very ount of chemical bye-products which are thrown into the sewage, had any serious impeding effect on bacterial purifi- With regard to improved chemical treatment, he should be epared to learn that a somewhat better result than that he d might be obtained, even with the process adopted by his sor, namely with solutions of ferrous sulphate and lime Mr. Dibdin had set himself the task of getting these chemiuced to a minimum; the present quantities in use were more or less a compromise, and he felt no doubt that if the s were increased to some extent, a better effluent might be l. They were not bound to produce first class effluent under rticular circumstances, and therefore they had made a comof the kind mentioned. He should certainly say that the uoted were not the best that could be obtained, if they were regardless of the quantities of chemicals used. As to the quantity in use, it would be difficult to state that without full explanation because the quantity would vary from time to time, corresponding with the varying quality of the sewage as it arrived at the outfall. Professor Clowes then referred to the choking of the bed, and in alluding to the remarks of Mr. Archibald, pointed out that this was a matter which would be fully dealt with in a further report about to be published in regard to some experiments which were being made on the subject of rapid sedimentation. The remarks quoted had referred to other experiments. A statement would shortly be issued in which he maintained that after a preliminary sedimentation of the crude sewage, the coke bed would undergo no choking within a comparatively small period of time. As regarded the advantages of excluding sunshine, sunshine killed bacteria and the spores of bacteria, but he did not think that sunshine affected a bed seriously because the coke was opaque and the light would not penetrate to a greater depth than two or three inches. The upper part of the bed did, of course, undergo a process of choking more rapidly than the under part, and the surface had constantly to be raked over in order to keep the bed open. He did not think he could say much with regard to the manurial value of an effluent. They were not concerned with manurial values. Mr. Dibdin, he believed, had made serious efforts to prove to farmers that there was manurial value in the sludge, but farmers did not seem to appreciate the value of it. Of course, the quantity of effluent they had to deal with was far too large for it to be allowed to flow upon any land; it must be sent into the river; and in the river it could only produce that very indirect manurial effect which Mr. Dibdin had referred to which appeared to be of advantage to the fish.

HOUSING OF THE WORKING CLASSES OF LONDON IN THE FUTURE.

By THOMAS BLASHILL, F.R.I.B.A.

(FELLOW.)

Read at Sessional Meeting April 4th, 1900.

aper which I read at the Southampton Congress of 1899
nhealthy Areas and Municipal Rehousing" dealt with a
nenon of our civilisation which, if properly understood
lequately met, may within a reasonable time cease to
le itself on our notice and practically disappear. But
earing of all our "Unhealthy Areas" would not put
n into the condition of a healthy habitable town. It
leave untouched all the evils of insanitary and over-
ed dwellings not forming statutory areas; and so the
m of housing in the future begins with the recognition of
evils and their abatement. Thus we have to consider a
ion that is limited and transient, and at the same time
r that is permanent. The evils of insanitary dwellings
overcrowding are too well known already; the question
to deal with them.

system under which these evils have grown up, and on
the housing of populations in general has been regulated,
ancient system of supply and demand. If I want a house
ch for it far and wide. That is demand. If houses are
, and those who want them seem trustworthy, there are
who will provide them on hire. That is supply. As
s I have known London the supply of houses for the rent-
g classes has kept pace with the demand; and when
who have taken them have vacated older houses, these
been occupied by another class less trustworthy, and one
ich the house-provider might hesitate to build. Thus for
reat bulk of our population, including all those who will
remunerative rent, and even for many of those who are
eliable, the housing problem is solved by the natural
h of the town; and were it not for certain disturbing
tions the system might be automatic.

The disturbing conditions as regards the housing of what we call the "working classes" are many. They include the encroachment of business premises and buildings of a public character on the ground formerly occupied by dwellings. Unwillingness in the people to leave a familiar neighbourhood, necessity to be near the place where work may be found, inability to increase earnings in proportion to the increase of rent. There is also, on the part of a large proportion of this class, and not of it alone, an inclination to spend money in other ways rather than in rent. Those who want new houses have to contend with the rising value of building land, and still more with the increased cost of building, and the larger proportion which the rates and other charges bear to the rent.

Lastly, I may mention an obstacle more serious than most others, in the increased demands of sanitary science as to house accommodation. These, however justifiable, bear for the time with excessive severity on those who must try to find house room on moderate terms.

Yet in spite of all this, and more, there is a very large section of the working classes for whom the housing problem is being solved in the old-fashioned way. This process has not received the notice that it deserves. We may remember fields just beyond Bermondsey that, on being cleared of their last crop of vegetables, were planted with working-class houses, so that within eighteen months they carried the population of a market town. Now, in those suburbs where cheap trains and cheap trams are having most influence, you may see farms being covered with houses, not by pairs or by half-dozens, but by roadsful and by hundreds. They are not jerry-built, the plans are excellent, the elevations are bay-windowed, there are good front gardens for flowers, and back gardens for vegetables or tennis. This is all weekly property, available for the fairly-paid artisan, unless it should be appropriated by the worse-paid clerk. It is inhabited before the plaster is dry; and the occupier who is reckless enough to hamper himself with house property may acquire his freehold or a lease that is as good. For those who do not require a whole house there are builders who provide a house for two families, or three. And the immense extent to which small families are accommodated as lodgers, without any approach to overcrowding, must not be forgotten. This is private enterprise, under the system of supply and demand. Let us give due credit to forces which effect so much, and not assume too hastily that they cannot effect more.

The provision of houses in blocks is a more risky matter, and the return is lower. There has for some time been an indisposition to go on with this work so necessary in and near to l districts, not so much on account of the scarcity of sites ause of the increased cost of building and the increase in cessary outgoings. Lastly, I will mention the more development of the common lodging house into a kind el or residential club, capable of vast development down- rom the level of the Rowton Houses and upward to with which we are not just now concerned.

se are developments in housing that are living and, for ost part, growing; presently we may consider how far ay be helpful in dealing with the lower paid sections of rking class, and, having foreshadowed my own views, it convenient if I deal as briefly as possible with some of w expedients that are now being proposed for solving s called the Housing Problem.

hese discussions we never fail to hear a liberal amount of imed at the ground landlord, or at his class, or at the which fosters the class. Before other societies I have to deaf ears against the mischiefs of the system of able leases of building land. It is a system peculiar to d, and almost limited to London. No one denies the onvenience of hiring land instead of having to raise the for buying it. But by our system the actual holder is "free," and there is a considerable period before the ation of a lease during which it is not to his interest to and it is out of his power to improve. Moreover, he is ated for improvements of which he will never get an te benefit, while the ground-landlord or his successors But this is a matter of more than private concern; for works are delayed to avoid burdening with rates these ary lessees.

cotland leases are in perpetuity, and the lessor, having rent, cannot benefit by improvements, and need not be p to public scorn. The lessee, being secure in his hold- n be adequately and without undue tenderness made his duty. Nevertheless, the law is not likely to be d just now for our convenience.

as been proposed to hold the ground landlord responsible e condition of the premises because he has failed to the lessee, under some supposed covenants in the build- se. As the owner of a leasehold house I once had to ground landlord to make an adjoining tenant keep his es in repair. He shewed me that the lease had been d by his grandfather, and the property might possibly nto the possession of his grandson, and asked if I could ably expect him to spend several years' income in trying rce covenants on an unwilling tenant, with a very doubtful prospect of success. In the case of working-class dwellings I suggest that the general law should be made strong enough, and that the municipality should itself see it carried out; not endeavouring to shift the responsibility on to shoulders less able to bear the burden.

Perhaps the most plausible case against landowners is that they are holding up land that ought to be built upon some years sooner than actually happens. So far as I know the owners of suburban land are only anxious for a chance of getting it off their hands by sale or preferably by lease. But land is very much like fruit which does not become marketable till it is ripe. You cannot acquire either commodity at a low price in its unripe state, and the owner of land, for which there will soon be a demand, will reasonably wait till the demand arises before he sells or lets. The proposal to compel a landowner to put his own value on his lands for purposes of taxation, and then to take it from him at a price calculated on such valuation, can only have originated with someone unacquainted with the rudiments of fair dealing.

But when the most has been made of the burden of ground rent, it is not very excessive when compared with the cost of building. The rise in prices during the last few years has added quite as much to the cost of dwellings as the amount of the ground rent, and this is at present the most serious obstacle to their erection.

Having said so much on schemes for getting money out of the pocket of the ground landlord, let me again mention a scheme of my own suggested ten years ago. Vacant land on the outskirts of a town has paid in rates practically nothing towards all the great works, the roads, bridges, public buildings, and everything on the construction of which, during past ages, public money has been expended. But as soon as the land is covered with buildings they enter into the enjoyment of all these things, without which, indeed, the land would still lie vacant. I suggested that the first year's ground rent, or perhaps more, might fairly be charged to the ground landlord on this consideration, and I still think the idea perfectly reasonable. Such a fund might be devoted to housing or any other municipal object.

Then it has been proposed to fix "judicial rents" in respect of all properties, by what means or on what basis I do not know. When this is seriously brought forward by someone competent to deal with such a business, one may feel more disposed to consider it. If its object is to put a stop to all negotiation and to all building except by the municipality, one can imagine that it would succeed. Building in future by the pality of all houses for the working classes is very often ted. No one has estimated the millions that would re- to be raised for this purpose, nor the amount of loss it is recognised would result. Recently it has been ted that as there must be a loss on houses for the working he municipality, or perhaps the State, should undertake lding of all houses so as to balance this loss by the profit n the houses of the rich. According to my experience g is an occupation about as risky as anything short of ng pure and simple, and of all branches of municipal g it has so far proved the least suitable.

ing given some of my own suggestions as alternatives to ust noticed I will now complete my list, distinguishing neasures which ought to be of a permanent character uch as are intended to get over a temporary difficulty.

classes that are required to be in some way "housed" are those for whose accommodation private enterprize is now g in the ways I have described, and above, though not uch above, the condition of paupers. They can make a ving if allowed to overcrowd dilapidated and insanitary gs, but the increase in their numbers and the pressing ds of the commercial class has for long been making position more difficult. The municipal conscience is n at the aspect of their surroundings, but it ought not ve itself at the expense of the sufferers, whose case, bad s, can easily be made worse. In measures strictly tem- to get over an emergency we must not be too particular economy, vulgar or political.

espect of unhealthy areas, I have suggested that for the the municipal authority should not spend money in g property, but should, at about one-fourth the cost, e the very individuals displaced. In the case of over- d houses this rehousing is not optional, but has now e a matter of necessity. You cannot turn all these nds into the streets. Powers must be obtained much r and stronger than those at present possessed by the ipal authority. Overcrowding should be defined by Act liament, and not left to local judgment or the ideas of a trate.

numbers that are given to show the extent of over- ing can only have been compiled by adding up the ex- e population of each separate house. I suggest that we l think less of the thousands and condescend to the te household. A census having been compiled of the rowded houses, the occupiers should be given fixity of e for a limited period at existing rents—the object being to prevent sudden depopulation before new houses can be provided. There should be effectual penalties prohibiting the admission of a new lodger until the inhabitants of the house were reduced below the number it could lawfully accommodate. The local authority might be the new Borough Councils working with the London County Council upon a suitable arrangement as to the expenses. They should at once set about the provision of new accommodation for those who could be assisted in that way. They should take into account the necessity or otherwise of accommodating any family in the vicinity of its old habitation, but there can be no necessity to rehouse any considerable number within a mile or even two miles of the old sites. The cheapness of passenger traffic is a reason for spreading these classes further from the centre as in the case of the classes better able to choose for themselves.

It will be necessary in most cases to rehouse at greater cost than the families are able to afford. Very often a family will have to live in two or three rooms, when it has hitherto lived in one. The municipality must provide that extra cost, including compensation for long distance travel, by paying it on account of the weekly rent direct to the owners of the newly occupied tenements. If the new tenements have been built by the municipality, the arrangement will be still simpler. This payment will only be made for a fixed number of years, to give the family time to adapt itself to the new arrangements. If a family should refuse such an offer, it can make its own arrangements, but it could not be allowed to go into a house already overcrowded. The law should for the future be strong enough to prevent this; and if an owner, in spite of the law, should take in tenants in excess of his proper number, the cost of rehousing them might be part of his penalty.

No doubt a very large number of new buildings will be required for rehousing—block dwellings near the centre, and cottages in the suburbs. In the present emergency it matters little how these should be provided. The municipal authority may build, but it should not discourage other persons or companies. On the contrary, it might buy land to be let out on reduced terms for building working-class dwellings, or the parish rates on dwellings so built might be temporarily reduced.

The cost of all this rehousing would be large, but it must be remembered that we are dealing with an evil which many people feel to be beyond expression in words. I read that "it overshadows all the problems with which the social reformer of the present day finds himself confronted." We have been spending fifty pounds per head in removing the population of unhealthy areas without rehousing; and I estimated that it would not have

-fourth of this amount to rehouse them, if we refrained
ying up the slum property. I am satisfied that this is
ssive estimate, if applied to the rehousing now under
ation.

nust assume that many of the people who have to be
l will need no help of this kind. A few could be settled in
try or in the colonies, and more might be taught to make
living than is common in their class. I never cease to
at the utter helplessness of the young and active of
ouring class" when the demand for labour of men and
is so much in excess of the supply. If I am told that
and is for skilled labour and not such as this, surely
o be taught; and it may be that of the large sums now
pended on Technical Education in teaching the skilled
be more skilful, a larger part might be devoted to
the unskilled man skilful and able to pay his way,
charity under that or any other name.

rs and cleansing are two other matters besides over-
g for which the municipality urgently requires larger

esent the law does not help but hinders the municipal
y that would compel owners to keep tenement dwellings
repair. There should be power to put an end to the
of any lessee who has shewn a determination to avoid
onsibility, so that the superior landlord may be reached
rged with this duty. And, as to cleansing, we might
the practice in the admirably-managed city of Berlin.
if the staircase of a tenement house is kept dirty, the
igade is sent to cleanse it, and the landlord has to pay
. If the tenement is kept dirty, it has to be vacated
ing cleansed by a similar process.

ing beyond the present emergency, we must assume
hin a few years the building laws and the laws as to
n will be made more efficient in the hands of the
al authority. Cheap trains and cheap trams will be
e in all directions. A very large proportion of the
s and workshops that now encumber and endanger the
districts will have been moved out to the suburbs or the
stant country, and the inconvenient crowding of work-
owards the City may be much reduced. The earnings
ge proportion of the poorer workers will be increased
s of their earnings will be wasted. A class below that
h houses are now so freely provided will show that it
trusted to pay rent, and if the cost of building can be
wn or reduced the demand will be met by a supply of
not perhaps so large or having so much open space, but

not less healthy than those I have described. It cannot be imagined that, as a permanent arrangement, any corporation will take up the housing of people who cannot pay a remunerative rent, for the deficiency on such a speculation would speedily exhaust the largest corporate funds.

I believe that the working man who longs to acquire his own house is a rarity; but, if block dwellings or groups of cottages can be made remunerative, small savings might be invested in companies formed for building or acquiring them, and it may be that habits of carefulness in the use of a house will be developed.

But when everything possible has been done in this direction there will remain some residuum of the population unable to house itself, and some of another sort that will refuse to work and will destroy everything that comes within reach. We are not grudging in these days in the relief of honest poverty, but the poverty that goes hand in hand with outrage will be less tolerated as time goes on and may tend to decrease.

No one can attack a subject like this without venturing into the region of speculation, and indulging more or less in prophecy. I have, perhaps, for the purposes of this discussion, gone far enough in that direction, and I submit these suggestions to such treatment as they may deserve.

THE CHAIRMAN (Mr. W. Wallace Bruce) in opening the discussion, said they had had a very interesting paper, and he thought the question divided itself into two branches; first, the question of unhealthy areas which were being cleared at very great public expense, and next the question of overcrowding which took place in areas that need not be unhealthy at all, simply an overcrowding of people in houses. These two evils required different remedies. In the case of the first, the question was how far a municipality is justified in paying large sums to move people out of insanitary areas in order to acquire them for re-building purposes. The law clearly contemplated that this should be done in bad cases, Boundary Street area in Bethnal Green was one of them and was formerly most insanitary, and a notorious resort of thieves and bad characters of every kind. No doubt the authority was perfectly right in clearing that away and re-building it. That had cost at the rate of £50 a head, not for housing purposes, but simply the loss entailed by converting that property from an unhealthy condition—free to be dealt with for commercial purposes—into a healthy condition, that could only be used by law for the housing of the working classes. After that expenditure they had to pay the housing value of the land and had to build the houses, the loss of £50 per head being involved in the sweeping away of the evil conditions for which there was no financial ıt all. Since then there had been cases costing a very great ıre. Clare Market area in Drury Lane was an area of 2½ a most insanitary condition, the only thing to be done at area was to clear it away, and to do so cost at the £80 a person. Then there was another area in St. Luke's ould cost £100 per head; but then there were other cases which were not quite so bad, and it became a problem how far they were right in turning people out of the area ı they would never return. The question as to whether any›uld possibly be done to leave the property standing, and yet healthy, was a point upon which some discussion would be Then there was the question of overcrowding which was ıother matter, and this evil arose from the fact that in the ›f London land is three times too dear to be lived upon. ıce had shown that it was impossible to buy land in these listricts to build block dwellings upon and obtain such a rent l pay the interest and sinking fund. The land in St. Luke's rkenwell, and similar central districts, was three times the ıat any artisan company or county council, could build upon a return. The result was that those persons who ought to ·ee rooms in which to live could only afford one room. The ͻ remedy for this evil at the present moment was for the Lonnty Council to build outside London. He thought that they rofitably consider whether the Council should do that, or this provision could be better made by private enterprise, ͻther the Council doing it would check private enterprise. ling in the public mind at the present moment was that ıg should be done to supply the dearth of houses which at exists, and no other authority was ready to step forward and vork except the London County Council, and besides it had one on a large scale. The question in many people's minds ufficient tramways and means of access to and from the outthe central portions of London were provided, whether the ·y accommodation would not be provided without the interof the London County Council. The point was whether ıs really needed was facilities for travelling—cheap and rapid ıg—to and from those parts rather than that the central ;y should build.

W. A. Bond (London) said that one difficulty which he ıd in his district was that a large number of houses were ly inhabited by the wealthy classes, and at the present ; these large houses were sublet in tenements. Where y only one family resided there were now perhaps a dozen. ıupervision of these houses was required, and he thought a leal more might be done if the existing laws were more ıtly enforced by the sanitary authorities. He regretted to hat sanitary authorities did not always like to enforce those Section 94 of the Public Health (London) Act he should like put into operation, for by its means they would have an annual cleansing of the rooms, and overcrowding could be more easily dealt with. Another difficulty was that frequently when a house was closed because it was unfit for human habitation, a factory, workshop, or warehouse was erected on the site, and thereby so much residential capacity was lost.

Mr. J. **Osborne Smith** (London) agreed that the subject was one which ought to be thoroughly ventilated, and thoroughly discussed; possibly they all had their opinions as to whether London was or was not a suitable place in which people should live; but, speaking personally, he thought that the suggestion which had been made by the Chairman that there should be facilities for travelling to the outskirts of London was one which was worthy of attention. This would enable more people to live like reasonable beings in the fresh air rather than being housed together in such a crowded condition in London. Land was too dear in London for houses to be built and let at such rents as the working classes could afford to pay. Therefore one solution of the question undoubtedly was the erection of houses outside London and the provision of means of access. He thought this would act in several advantageous directions, and enable the workers to do their work better.

Mr. **Langton Cole** (London) said the point to which he desired to address himself was somewhat apart from the question raised by Mr. Blashill, namely the extreme difficulty of building on available sites of London, owing to the operation of the London Building Act. In some cases the areas which had been condemned as insanitary could not be used for dwellings, although warehouses of double the height of dwellings could be erected upon them. The cost of building was largely increased, not only on account of the increase in the price of materials, but on account of modern building regulations, which had not only increased the cost of building, but bore with unnecessary and increasing severity upon the building of dwellings for the working classes. There were numerous conditions in the London Building Act which restricted the height and area of the buildings for the working classes, but they did not restrict them for any other purpose. He gave an instance of this which had come within his own knowledge, and said that the result was that the stringency of the laws and the bye-laws had rendered the erection of dwellings for the working classes impossible in the places where they were most wanted; to a large extent it was a case of killing with kindness. The County Council bye-laws had been framed with the very best intentions, but the result of their enforcement was to prevent the erection of a class of dwellings which was urgently needed. The erection of dwellings for the well to do and well paid artisan classes was not difficult, as these were generally provided by private enterprise. The difficulty was in providing housing accommodation for those persons who had precarious means of living, and who earned extremely low wages. It was that class to which the Council should turn its attention. This portion of the problem had not been touched at all by the operations of the Council, and he that if it were to be dealt with by other persons—for the had shown its financial inability to do it—then the building s would have to be relaxed in some particulars. It was to coddle the working classes too much, and the tendency to as one of the explanations of why it had become impossible ide those dwellings which were most required. He trusted don County Council would give this matter their earnest ation, and not continue to put obstacles in the way of private se, which, if given fair conditions, would do all that was of it. If the cost of building was continually and steadily d by the regulations as it had been, such dwellings could uilt by the Council or by anybody else.

WHITE (London) said the evil was well known to everybody as continually before the public, and the question was what could be found. From the discussion that evening he aid he had not learnt much more than he knew before, rd how the difficulty was to be overcome. He was sure shill would bear with him if he criticised some of the remedies ad been suggested. Mr. Blashill had suggested that the s should surrender the first year's ground rent. As a he could say he had never built on land unless the landlord ered the first year's ground rent. This was usual; but Mr. Blashill meant that the second year's ground rent also be surrendered. He had always found that the land could very well take care of themselves, and he did not think ld be blamed. Land could be let very readily, and it was not uncommon thing for a premium to be obtained even when it ught that the utmost price which could be obtained for the d been paid; besides any arrangement to stop the first or year's ground rent would not be exactly a remedy for which would have to pay, but it would be a remedy for which the or occupier would have to pay, for on the condition being com- th the value or price asked for the land would be raised. Some- other the amount had to come out of the property which was s an investment. Then Mr. Blashill suggested that there be a reduction in the parish rates. Well, already local ties made considerable reductions on houses let to the working and this sometimes amounted to 20 per cent., so that this f building really did pay less in rent than their face value show they were entitled to do. The suggestion made by ashill that instead of throwing away large sums of money in some areas, the money might be applied towards the re- of the people seemed to be much more practical. He was te sure, however, how this scheme would work out, and they be careful, for many new schemes looked very well on paper, rectly they began to be put into operation serious difficulties rose. Some difficulties occurred to his mind, but he did not hey were altogether insurmountable. Speaking for himself he und to say he thought the London County Council had made things worse than they were at the commencement. The Chairman had remarked that they cleared away thieves and bad characters from the Boundary Street Area,—well, where had they gone to? Those persons had to be housed somewhere, and only 3 per cent. of those persons displaced from the area had been re-housed on the site. Obviously the clearing of that area had not benefited the condition of those persons who formerly resided there, and had probably aggravated the conditions of another locality. It had often struck him when these questions were being debated in the Council, what would become of those poor creatures turned out of this slum property in order to make room for the improvements. The class of persons the London County Council had in its buildings was the aristocracy of labour who could afford to pay 8s., 9s., and 10s. a week rent. Now there were plenty of people willing to supply property for this eligible class of tenant, but this left the root of the question entirely untouched. What they wanted to consider was how to house those poor unfortunate creatures whose wages might range from below 18s. up to 25s. a week, for whom it was quite impossible to pay the rent of two rooms which they were required to have when they had children. The difficulty was they had not got low down enough in the question, and he really did not see quite how it was to be done. One or two suggestions had occurred to him in order to reach the lowest possible class—the most undesirable class of tenant—because the Chairman would admit they only dealt with the most desirable in the Council's dwellings. They had to think of the poor class of unskilled labour, who only got a casual living, and to whom it was a necessity that they should live near their work, near the Docks, or other places where there was a chance of picking up a job. For this class the remedy of building outside London did not apply. It would not be any help to this casual class to offer them cheap trams to the suburbs for they must be accommodated within a reasonable distance of the place where they could labour. Dr. Bond had said that the sanitary authorities did not enforce the law. As a member of a sanitary authority, he could say that they very often realized that to put the law in force was to inflict a very much greater hardship on the people than to let matters alone, and allow them to remain badly housed. In Marylebone when reports had been made to the local authority, and orders were asked for to have the people turned out, there had always been persons of humanitarian ideas who had pleaded for these poor people not to be turned out into the street, particularly at the commencement of the winter. Some four or five months ago his Vestry had to deal with cases of this kind in Lisson Grove, and he, for one, although desiring sanitary reform, felt he could not hold up his hand to turn people out wholesale into the street. It was impossible to say where they would go, probably eventually they would have to go to the workhouse. To make them paupers was not to improve their position. Anxious, therefore, as sanitary authorities might be to enforce the laws they had to be careful not to inflict a greater hardship on certain sections of the community. He was quite sure that if they ted to enforce these laws and turned people out wholesale ould in the end do much more harm than good. All kinds of remedies had been proposed, but there was one which he like the Council to consider in dealing with this question. He ne to the conclusion that the Council must go on with this ; question for they had created the position in a great measure enting the private speculator entering the market, the Council have to accept the duty it had placed upon itself by the g Act. As a member of the Building Act Committee he had d over and over again the practice of erecting factories and ops on the sites where dwellings formerly stood. He thought e Council might do something by encouraging owners not to the character of the user of land in the metropolis. No he Council paid huge prices for insanitary property, and as great temptation for unscrupulous persons to allow their y to get into a worse and worse condition in order that it e bought out. This difficulty was only to be met by going to ent and obtaining a fixed scale of compensation. To begin oot with the freeholder, if the freeholder could show that he nply been receiving a nominal rent, and had no power to conditions, and could prove that he was not in any way to or the insanitary conditions which had grown up, he should e value of the land as a cleared area for building purposes, premium or prospective rent or reversion should be taken count. That would then enable the Council to start by ob- the land at its actual value for building purposes. Then in of the leaseholders, and there were generally three or four if they were found ever to have allowed the property to fall bad condition then the property should only be valued at he lease would be worth if the property was properly and occupied at a fair rent. When that sum had been ascertained ld like the law to be altered, that is a penalty inflicted for neglected the property, so that the leaseholders should be l to half the capital sum they would have been entitled to had perty been kept in proper condition. If the law were so he t it would prevent a great many persons who were now ; out of insanitary property from obtaining such large sums of compensation, and that a penalty would fall upon them for neglected to do their duty. He thought the Council would e able to deal thoroughly with this problem until there was nendment of the law in this direction. The Bill now before use of Commons was good so far as it went, but it was only a nall matter. A great deal more was necessary, and he was ure if they went on as they had been doing for the last ears they would not overtake the problem. Only a drastic in the law would enable them to cope with the difficulties. re the matter was ventilated the better it would be for those they desired to benefit. They often talked about buildings had been erected, and the return that was needed to meet the igs and maintenance, and at the same time they must remember the enormous sums of money that they had paid by way of compensation before they began to consider the value of the land for housing purposes at all. He thought it was a great shame that the people of London should have to pay these sums for property which, if it had been properly looked after, would never have got into this very bad condition.

Mr. A. H. Campbell (East Ham) spoke of his experience in provincial cities, and at Edinburgh where he had worked for ten years. The evil of overcrowding in the Scottish capital was found to be just as crucial and as severe as in London. What he had heard that evening had been a recital of his own experience. The difficulty in Edinburgh, however, had been got over partly by the Corporation erecting model lodging houses, not intended for the aristocracy of labour, but for the residuum of the population, the lowest class. These had sufficient accommodation given them for themselves and their families, with the difference that they had a common kitchen. These lodging houses had been found to be successful, and being under municipal control were properly conducted and managed. There was plenty of public spirit behind the movement to support the Corporation in this work. The conditions of Edinburgh had vastly improved, and there was a belief that in that city the authorities had at last touched the fringe of the overcrowding problem. From his own experience he desired to emphatically repudiate the statement that the municipal authorities of this country were not alive to their duties in regard to these and other sanitary matters. Whatever might have been the case ten or twelve years ago it was not so now. The difficulties which the authorities had to face were that they had to repay the cost on capital of buildings within thirty or forty years in the provinces, and sixty years in London. This was too short, but even if they had sixty years in the provinces it would help them very much in dealing with this great question. The result of this was that they were handicapped in the amount of rent they had to charge, and until these fiscal arrangements were altered he believed that they would be unable to provide dwellings for the labouring classes, either in the metropolis or provinces, at rents which the occupiers could afford to pay, and at which the local authorities could afford to let in order to recoup their outlay.

The Chairman (Mr. Wallace Bruce) in summing up the debate, explained in regard to Mr. Langton Coles' observations that the Council found existing certain conditions of things which rendered a new Building Act absolutely necessary. The Housing of the Working Classes Act made it compulsory on the Council to undertake clearances schemes if the Medical Officer of Health represented those areas as being unhealthy; the Council had no choice in this matter. They found slum areas being created at a great rate under the old Building Act which was a very defective one, and led to all sorts of overcrowding of buildings. They would all agree it was right for the Council to take some measures to prevent these evils being perpetuated.

particular conditions to which Mr. Langton Coles had referred
been deliberately adopted for special purposes. It had been
necessary to put in some limitation, but whether they had gone
r in this matter he could not say. Possibly the subject was a
able one, but, on the whole, the result had been good. It was
sible that they could allow speculators to go on putting up
ings in narrow alleys which in a few years' time would become
property, and which would have to be acquired by the Council at
ous cost. Mr. White was only a recent recruit to the Housing
Working Classes Committee of the Council. Had he been on
ommittee as long as he (the Chairman) had he would hardly have
the remark that in its housing policy the Council had done more
than good. Some years ago they had before them 160 unhealthy
notified by various authorities. That number had gradually
diminished at little expense to the public by putting pressure on
rds and local authorities, because even within eight years ago
cal authorities of London were not as they were at present,
hey were found to be very negligent in discharging their duties.
tting pressure on them and others concerned, the number of
lthy areas had been so considerably reduced that now only a
emained on the books at all. These areas had been improved
ut any expense, except in a few extreme cases like the Boundary
and Clare Market areas. Mr. White had said they had done
od, and all he could say was that the people in those slum areas
had been cleared had been dying at the rate of 40 per 1,000
none of those parts to-day would that death-rate be found to
therefore, it was perfectly certain that some good had been
to the residents in those areas. Mr. White asked where the
al inhabitants had gone to. Well, he could tell him where
ne of them had gone to, for a register had been kept. These
were not all turned out at once, they had had many months
and information as to accommodation in neighbouring parts
btained; that accommodation was inspected by the officers of
ouncil, and in turn the inhabitants were conveyed to the houses
had been approved. In that way everyone of those people went
place that was known to be decent to live in, instead of into
ned insanitary hovels that formerly existed in the Boundary
area. Personally, he had not the remotest doubt that the
ion of these people was far better now than it was before.
Vhite thought it would be right to draw a "ring fence" round
ity, and say now this land which has hitherto been used for
ng houses shall not be used for anything else; that land shall
-marked for dwelling houses. Now the tendency for years past
een for commercial buildings to extend from the City outwards,
ally was this noticeable in Southwark and to the south of the
There was a continual extension of business premises, and
it be wise that the business part of this great city should not
owed to extend; that would be the effect of the adoption of
Vhite's suggestion. He could not conceive this to be a wise
. It would have to be done everywhere, and there could be

no exception made for localities. Mr. Campbell had spoken with regard to the period for repayment, and he was glad to say the County Council had been agitating in that direction for years, and were asking for 100 years as the period for repayment, and that the land on which the buildings were erected should be taken as an asset against debt, and should not be repaid. Interviews had taken place with the Home Secretary and the Chancellor of the Exchequer, and the Treasury authorities now had the matter under their consideration. With regard to the high class of houses which the Council erected this was not altogether the Council's fault. To a certain extent they were unable to provide for the residuum of the population. The Housing Acts required that all plans should be submitted to the Home Secretary in London, and, rightly or wrongly, the Home Secretary had always taken the view that the site having been cleared at public expense—at very great cost—it would be improper to allow houses to be erected which in twenty-five years might become insanitary again; and this raised the cost, which in its turn increased the rent. All the Council could do was to follow this principle, and if the houses they had erected were of a higher order than was deemed to be necessary they must not blame the Council, because they had not a free hand in this matter.

Mr. T. Blashill (London), in reply, said he was very gratified at the way in which the paper had been received. He had not expected that everyone would agree with him, and was glad to have heard the remarks of Mr. Smith and Mr. Langton Cole. Of course, it was necessary to have some building laws, but he was very much of Mr. Cole's opinion that it was unfortunate that the condition referred to should have been so stringent. A clause which was intended for the advantage of the working classes had, as a matter of fact, operated in exactly the opposite direction. Possibly when the time for legislation again arrived a similar object might be attained without incurring the mischief of which complaint was made. Reference had been made to the residuum of the population, but they must remember that there was a point beyond which they could not go in regard to cheapness of dwellings. He was much obliged to Mr. White for having taken the trouble to be present that evening, and in reference to his remark as to the absorption of the first year's ground rent, of course, he had meant by that the first year's ground rent receivable by the ground landlord. They were told that whatever was done in this direction it would ultimately come out of the pocket of both builder, or tenant, or occupier. Well, he did not pretend to decide how it would operate, but he thought it would be a good way of catching the landlord and obtaining a contribution. He thought however, in regard to the whole of this question that they must re-house the persons they displaced, or they did no good at all. They must deal with each particular house, or they would never settle the question of overcrowding. He thought by a moderate expense they could provide house accommodation, or induce other people to provide it, either near or at a distance off. Something

en 6d. per head per week and 1s. would be a fair estimate,
ould not be an excessive amount to get rid of the greatest
m of the day. He did not think that the County Council
riven out the speculator. Of course, he knew that the trusts,
e semi-philanthropic, or wholly philanthropic dwelling com-
, were not building, but he did not know that this was caused
County Council so much as by the fact that the cost of
g was so great now that these companies were obliged to hold
hands. He thought this had more influence than anything in
atter. He did not wish to be understood to say that the Lon-
ounty Council had been wrong, he had never said that; but,
obvious they were trying a great experiment, and no doubt
tain directions they had done a great deal of good, but they
not go on as they had been doing in the past. This expendi-
ould have to come to an end sooner or later, and ought to
to an end now. Mr. White had made some remarks with
to dealing with the ground landlord in regard to houses, but
ught not to forget that the ground landlord was not the
who had been receiving the greatest rent for all the years;
bability was that the ground landlord had been receiving
moderate rent; therefore it would be rather cruel when
who had waited so many years was just about to get a
roperty, that it should be taken away from him in the way
ted. He did not think this would be the right way to get over
ficulty. He was glad to hear the remarks of Mr. Campbell.
not know quite so much in regard to the operations in
rgh as he did of the operations in Glasgow, and he thought it
ossible that something might be done in London on similar
At present the lodging houses in London were only for single
in Glasgow for single men and single women; but he did not
nyone in London had attempted to do for families what had
en described. The difficulty in providing for families in this
s that they must have rooms of a much larger size than the
which was now provided for sleeping purposes, and the
ty was that the persons to be accommodated would not be able
the rent. He should, however, like to hear a great deal more
egard to the Edinburgh plan. It was not necessary to
size the need for a lengthening of the period of time for repay-
f the capital investment, and probably the agitation in that
n would in due course bear fruit. He was glad to be able to
ce that at the meeting of the Council of the Institute that day,
een decided to hold at some time, at the end of July, at the
Museum, an exhibition of plans and models of artisans'
gs, and it was hoped to have papers upon the important
ns involved in the problem. He thought that an exhibition
kind would be of considerable public use. He trusted the
rs would take advantage of the opportunities which were
to them.

DINNER OF THE INSTITUTE.

The DINNER of the Institute was held at the Holborn Restaurant on Friday, May 11th, 1900. H.R.H. the DUKE OF CAMBRIDGE, K.G., President of the Institute, presided; there were over one hundred present.

HIS ROYAL HIGHNESS THE PRESIDENT, in proposing the toast of Her Majesty The Queen, drew attention to the fact that after a very long reign Her Majesty was enabled to carry out those kindly duties which she had performed continuously in attending to the interests of the very large number of hospitals and establishments connected with the great contest that was now going on in Africa. In proposing the toast of the Prince and Princess of Wales, and the other members of the Royal Family, the President referred to the danger in which the Prince and Princess of Wales had recently been placed, and expressed the feeling of thankfulness that was in all hearts at his escape from injury. He also referred to the lively interest that members of the Royal Family had taken in the work of the Institute.

THE RIGHT REVD. THE LORD BISHOP OF LONDON, in proposing the toast, "The Naval and Military Forces of the Empire," said: We have every reason indeed to be proud of our army; and we have been learning in the last few months very many lessons from them. They have taught us what the average Englishman can do; they have taught us what is the spirit that animates this country; they have taught us a lesson of quiet obedience to the dictates of duty: and of readiness always to rise to any call that the country may make for the service of her sons. It is for that reason that there never was a period perhaps in England when our army was regarded with such feelings of admiration as it is at present, and when we are all so much at one in admiring it and in recognising its splendid services. All of course know that to a meeting such as this the army presents problems of a kind which it does not offer to an ordinary person. I suppose you have been watching many points in the conduct of the campaign which the ordinary observer would pass by. You have an interest of your own in watching it. This Institution is connected with the army from many points of view. Many members of this Institute have also been connected with military service. Dr. Parkes of Netley, to mention only one, was connected with this Sanitary Institution, and also with the superintendence of many points of sanitary reform connected with the service. Now there is much which sanitary science has to learn from massing a number of soldiers in the field. You have problems in which you are interested, isolated and interesting in many forms; indeed the beauty of sanitary science was put before me rather forcibly by a story I heard the other day of a schoolboy who was asked to write an essay on the "Pin." Well, he wrote an essay upon the "Pin" in which he gave an account of its manufacture, which was perfectly and made many wise remarks about the Pin and its uses, but end of the essay he said "the Pin has saved many lives by not ving it." That, of course, arose from the sanitary teaching he was given that while using a Pin it was not desirable it in your mouth. I apprehend that a campaign also teaches od deal about the things it is not desirable to put in your and that in time of active service we learn that a great hings maintain your health and save your life by not swallow- em. Now that is what the army has, I think, been teaching . The records that are given of the excellent sanitary condi- f the army are very satisfactory, and they show that the s which have been rendered by this institution are not thrown n times of emergency. You, gentlemen, have your place— of your own—in the conduct of our campaign; a high and able place which connects or goes particularly with the es of our forces at such times as these. But I do not wish to upon that particular point of connection between you and the You share in that delight with which all Englishmen at the t day are admiring the conduct, the behaviour, and the bearing forces in South Africa. The best wish that we can wish them ent is a speedy return, and I think we must all feel that the of the last few days have made that return seem more possible t did before. We have high hopes at present—high hopes e news of the next few days may be even more prosperous, at we may look forward to the time when we may welcome ur brave sons to the land from which they have been for so me absent. I give you the health of "The Naval and Military of the Empire," and I couple with it the name of Director- l Jameson, C.B.

geon-General J. JAMESON, C.B. (Director-General of the Army l Department), in responding, said: I think perhaps it would e me on this occasion to refer more particularly to my own l service for which I am in some degree responsible. We ognise the great magnitude of the war in which we are engaged. l hardly say that the strain which has been put upon the l department is a very severe one, but I am happy to say, from ndent testimony, that the department has stood the strain. ave that from the testimony of Sir William McCormack and eves, both of whom have returned and given us their experi- Ten days ago I received a letter from Sir Redvers Buller. ntioned one thing which interested me very much, namely, that s perfectly certain that the soldiers knowing that they would l looked after in case of being wounded was a fact that inspired greatly with courage. Now I must admit that I have received reatest encouragement from the War Office; that is to say, ave given me permission to spend any amount of money for od of the sick and wounded; but there is one thing money t purchase, and that is the trained hospital orderly. At the ing of the war my establishment was simply on a peace footing.

Since then we have been called upon to send out hospital after hospital. All our men were expended long ago. We then issued invitations to the Volunteer Medical Staff Corps, the Militia Medical Staff Corps, and the Brigade Bearer Companies, and we received a great response from everyone, but best of all from the St. John's Ambulance Brigade. That Brigade alone has given us over 1,300. We have at the present moment in attendance upon the sick in South Africa no fewer than 8,000 men as male attendants. But that is not all; we have also a very large number of nurses given to us by almost every Colony—Canada, New Zealand, Australia, and the Cape—numbering altogether 536. There is, however, one little rift in the lute, the presence of some untrained ladies at the Cape. These ladies are more gifted with heart than brain; their kindness is beyond dispute; their intentions are excellent, but at times they do very queer things. They go into the hospitals with all sorts of food, and they distribute it to all sorts of patients with all sorts of diseases. One lady gave a number of buns to some cases of enteric fever. On this occasion, in this company, any remarks without reference to Dr. Parkes would be like the play of Hamlet without the prince. I purpose therefore to make a brief comparison between two great men whose objects in life were as opposite as the poles. I refer to Napoleon and to Parkes. Such is the strange condition of men's minds that even after nineteen centuries of the spirit and teaching of Christianity the first name, Napoleon, is held in greater respect than the latter. The explanation, I presume, is that it is the case that the power of evil always interests men more than the power of doing good. We all know the history of Napoleon; but how few outside a small scientific circle ever heard of Parkes. He was the founder of sanitary science, and as an army surgeon I can say that the knowledge given to us now is simply the superstructure upon the foundations laid by Parkes. There is an interesting fact in connection with his appointment to Netley, that it was made by His Royal Highness, our Chairman to-night, and it is through his influence chiefly that the medical school at Netley has been maintained.

Sir WILLIAM PREECE, K.C.B.: It is my pleasure to propose to you the toast of the Houses of Parliament. The House of Lords is perhaps the only institution in this country which may be said to have anticipated Germany in the introduction of technical education, for from time immemorial the eldest son of a Peer has always been educated and brought up to, and knows how to fulfil, those duties for which he ought to be technically educated. As regards the House of Commons, it has this peculiarity that every man in the House of Commons may say exactly what he likes, but he can only do that which he is told to do, he is bound to blindly follow his leaders. Unfortunately I can speak from my own experience of the one sideness of the House of Commons, and that this is the effect it has on the Civil Service of this country. If there is anything more disagreeable than another to any officer of Her Majesty's Service, it is the unnecessary and foolish questions that are asked in the House of Commons.

appy to say I am now free from those questions, but the time ien I went to my office with dread and discomfort, knowing ere were several questions to be answered that night. If you o see the House of Commons, or the House of Lords, at their o to a Committee of that House. There is no tribunal in this that is conducted with more skill, with more patience, than mittee of either the Lords or the Commons, especially the Committees. It is my misfortune to appear a good deal before Committees, and I am bound to say I never come away without ig of wonder at the patience and judgment displayed by those on those Committees. Many of us feel some kind of dread e Houses of Parliament, but we all feel a respect for them as ad none do so more than those who know how the chiefs of ious departments attend to all the business that is entrusted o. Associated with this toast are the names of Earl Stamford o Mr. T. W. Russell, the Parliamentary Secretary of the Local ment Board, and in associating his name with the toast I am nt that it is the name of a gentleman who will accord to those servants who are obeying his commands the credit that I is due to them.

Right Hon. The **EARL OF STAMFORD**: I am afraid I can hardly r myself among those whom Sir William Preece has described ng received a long and special training for the House of Lords, hink there are certain advantages connected with that fact in id interest and delight with which one gradually grasps the which these great parliamentary bodies hold in the British ution. Throughout the last ten years in which I have member of the House of Lords my interest has grown nd greater as one realises—I speak of the House of Lords—parently little work is done there, and yet directly one gets the surface one appreciates the valuable volume of work which sacted by men who acknowledge themselves to be uncommonly her people, and who do not wish for any special recognition lit for the work which they are ready to perform. As Sir n Preece has already mentioned, the greater work of Parlia- s done not downstairs but upstairs in its numerous committee rooms where by serving on Committees on private Bills one s acquainted with the many ramifications of English public ne becomes acquainted with a number of subjects of which one guely heard before, but which on those Committees one has be to the bottom, and form one's independent opinion upon. k the last time I had the pleasure of dining with the Sanitary ite I was able to speak of a small bantling of my own, a little hich had just been brought up in the House of Commons; it ited there, and I had the honor of piloting it through the of Lords. Possibly one point at least was improved in the of Lords, for the Bill did not bear a particularly pleasant title it reached us from the Commons. However, it emerged from louse with the highly respectable title of the "Cleansing of

Persons Act." Following this little Bill throughout all the Committee stages one grasped by degrees what wiles one had to employ, how one had to go from one office to another to interview the various heads of departments, and to satisfy all the scruples which might be felt by someone or other at the Home Office or at the Local Government Board. I spent some weeks in going through these interesting processes, and it is a satisfaction to know that this poor little Act, with which I made myself so closely acquainted, has been used to a large extent in the parish in which The Sanitary Institute itself is situated. It has commended itself to an extremely forlorn section of the British Public, and I hope has enabled them to rise one little step in the social scale, and to qualify themselves for useful work as citizens of the community.

Mr. T. W. Russell, M.P., Parliamentary Secretary to the Local Government Board, responded for the House of Commons. He said: I gathered from the opening remarks of Sir William Preece that he had not quite so high an opinion of the House of Commons as I think everybody ought to have. But I confess I was astonished at the illustration he gave of its principal defect. As one of the Parliamentary chiefs of a State Department I think the interrogation of Ministers at the opening of every sitting of the House of Commons is one of the most valuable things in the House of Commons itself. I have no doubt a great many foolish questions are asked—questions that might be answered by the Department privately, if necessary, and at all events in writing, and time might be saved. But the right of members of the House of Commons to interrogate Ministers of the Crown is a right which I hope this country will never give up. Sir, I agree with what Sir William Preece said in regard to the Committees of Parliament. I entirely agree that Parliament is seen at its best in those Committees; and perhaps this audience will think it rather singular if I admit that I think the Committees of the House of Lords constitute the better tribunal of the two. There is a reason for that, the House of Commons is constantly shifting—we are made and we are unmade, but the House of Lords goes on for ever. And you have on that account experience continued from Parliament to Parliament, and they must be very dull men indeed if that experience does not improve them. But I am entirely of opinion that no better tribunal could be had in the wide world than Committees of the two Houses of Parliament. Passing from that perhaps I may be allowed to remind the members of this Institute that two years ago I responded to this toast at their Annual Dinner. At that time a Bill was passing through the House of Commons about which some very hard things were being said—I mean the Vaccination Bill. I spoke with fear and trembling at the dinner. I was speaking to gentlemen who knew a good deal about the subject, and I was told going out of the hotel that "If you go on with this Bill you will lose 50,000 votes in the country." Well, we did go on with that Bill. It is a dangerous thing to prophesy without knowing. In two years after that event I am able to stand here, as one

hiefs of the Department which has the administration of
that was passed, and I only wish I could say of every Act
ment what I am able to say of the Vaccination Act—that
been one of the most pronounced successes in English
n. I take courage from that fact to refer to another
ll that is now being discussed in the House of Commons—
t the other night upon it; and it is a Bill this Institute
great interest in, and rightly so—I mean the Bill for the
ousing of the Working Classes. It is not necessary in an
like this—it is not necessary anywhere—to dwell upon
ense importance of that subject. If things were as they
be in this country it would be far and away the most important
before the public. Happily, it is removed from all party strife
hardly be made a party question. Whilst it was being debated,
id by almost every speaker on both sides of the House of Com-
at the Government Bill was defective—that it did not go to
of the matter. These things may be admitted, gentlemen, the
stion is, does the bill meet a great and clamant need—not
it might not be improved, but whether it really meets a
at is pressing and urgent at the present moment. Talk of
the root of the matter! Oh, the root of the matter is much
than the politicians know or think. It is not only model
s that are required, but a model people to inhabit them, and
't make moral people by bricks and mortar. Now, take this
ty in which we live. What is the crying need with regard to
tion as it affects London? Of course, if it affects London, it
very other large city in the same way, though not to the
tent probably, but to a very large extent. What is the
eed of London in regard to the housing of the poor? It is
ome people think, the enforcement of the present law by the
thorities, although that is very important, and it is grossly
d. I think it is a stain upon our local government that it is
tent. But let the truth be told. The rigid enforcement of
sent law in London just now would probably lead to results
uld startle humanity. You cannot turn people out of houses
sands and tens of thousands without having some place in
o put them. That is what I mean by startling humanity. It
the actual enforcement of the law, although I know that is
nt, where it can be legitimately done. The need is space—
d is room to live. Now a great deal is said about the County
. I do not know whether there are any representatives of the
here to-night. (A voice: yes, the Chairman.) Then, I shall
the more willingly what I desire to say, in their presence
than in their absence. I have never been one of those who
tly pick holes in the work of the Council, and constantly find
ith them. I have done nothing of the kind. I do not believe it
ed; I believe they are carrying out a great work amid tremen-
fficulties, and they deserve the gratitude and the encourage-
f the citizens of London. What is the real difficulty that the
l has? What is the use of talking about finding space in this

crowded Metropolis? It is almost wholly built over, and what open spaces there are ought not to be built over, they ought to be left as lungs for this great city. It is not possible to find space in this crowded Metropolis for the poor who inhabit it. Then what follows from that? You must go outside. That is exactly what the Government Bill proposes to give the Council power to do. I say that therein it meets an urgent and clamant need, whilst it shuts the door to nothing else. I heard in the House last night—I hear a great deal there that one is bound to hear, and I suppose is bound to pay the respect to that it deserves—I heard lawyers declare that the Council had that power already. Well, all I know, and I happen to know it officially, is that the Council does not think it has that power. I do not believe they have, and what this Bill proposes to do is not to settle this question—it will take many bills to settle it and it will have to be settled in many ways;—what the Bill proposes to do is to give the Local Authority in this and every other great city where there is no room within their own area, to go outside that area and purchase land compulsorily, and so let the people have a chance of breathing fresh air, and have air space to live in. Now, we might call that a simple matter—you may call that touching the fringe of the question if you like; I say it removes a great difficulty, a great oversight in legislation of the past and supplies an urgent want. It does not shut the door to anything else. But I should like to refer to another part of this question, if you will bear with me. It is an entirely different part. It refers to the clearing of great insanitary areas for the purpose of erecting workmen's dwellings. Now there is plenty of legislation on the Statute Book to enable the Local Authority to do that. It is not want of legislation. There is plenty of it. As we say in Ireland—because I never forget that I am an Irishman—we have Acts of Parliament *galore*. What stands in the way? Why the cost stands in the way. It is the cost of clearing those areas which stands in the way. How can you pay those enormous sums for compensation, and then build your houses and let those houses at a rent which the working men can pay? It cannot be done, and if this cannot be done on commercial principles, it never will be done on the principle of philanthropy. Well, now, how is that to be met? In my opinion when it is dealt with it will have to be met by an entire change of procedure. Mr. Chamberlain said, when he was examined before the Commission in 1884, I think, that they had acquired a great area in Birmingham, and that the Corporation of Birmingham had spent £500,000 more in compensation than they ought to done. That is a tremendous handicap to a local authority. That has to come out of the rates; and of course, it discourages, and it frightens the ratepayer and work is arrested. But Mr. Chamberlain added another thing, and it is this—it is still more important—he said he never could understand how it came about that these gigantic sums were given to owners of slum property: that had he had to draw the Act of Parliament which regulated the same, he could not have drawn it in clearer or more explicit language, and yet the arbitrators gave these large

Well, now, I say that that difficulty can only be met, in nion, when the question comes to be dealt with, by an entire of procedure. Now, my last point—because I do not wish to take up the time of the company—it is being pressed e State Department which sanctions the advances ought nd the term of the loan. I find that is exceedingly popular. all willing to make those people who are to come a hundred ence pay for us. Gentlemen, that is not business. The people to come after us in seventy, eighty, or a hundred years, will eir own responsibilities to meet. I do not think it is entirely onomy that we should make the ratepayers of to-day reckless ravagant, because he knows that he has to pay very little, and sterity has to pay a great deal. I think there are two sides to stion. Something may be said for giving a longer period for an is given now. But I very much doubt whether it would , wise, or expedient to extend the period for mere building But, gentlemen, whatever may be said on this point, and a eal will be said, in Parliament, before this question is settled, an be no doubt that the country and Parliament are in earnest is question, and if the country and Parliament are in earnest nd means will be found to meet the difficulty. This Parliament ically moribund; the House of Lords, of course, goes on for hat is an immense advantage. A friend of mine, an Irish r in the House of Commons, said the other day while we iscussing the question of the attempt to throttle discussion at meetings, and some of his own friends were protesting very against it—he is an Irish Nationalist and a very good fellow ope there is no proposal to put down opposition at election gs; for if that is done, half the joy of my life will be gone" er) I may mention that he is generally followed about op of Lancers or police. But although the House of Commons from the House of Lords in that respect, I do not know that ld care to give up the privilege of now and again coming o the people and receiving the mandate of the people on great issues that have to be fought out in Parliament. But erfectly certain of this, when the general election comes and it now be far off, this question of how to house the people, er it is to be done by public or private enterprize, or whether be done by municipal enterprize; this question will be one of eat issues upon which that election will be fought. I hope nent will come back to Westminster with a mandate far above rty questions and our party feelings; and that Parliament will rced. I do not think it will require much coercing, to find a ut of this enormous and pressing difficulty. Gentlemen, I you in the name of the House of Commons for drinking the of that Assembly (cheers).

Royal Highness The Duke of Cambridge: I must ask ur indulgence in the toast I am going to move now, because I feel that there are so many around me here who are much more conversant with the special duties and requirements of this Institution that the toast would really be in much better hands with them than with me. I can only in a very cursory manner allude to the objects which we are assembled here to-night to promote, and the purpose of the Institution which has done such good work. The Sanitary Institute has now been in existence for, I think, about twenty-four years, and an old friend of mine, who is now gone, alas, the late Sir Douglas Galton, was one who had a great deal to do with bringing this body together for the first time in order to promote the objects we have in view. When I look at the figures, with reference to the progress of your work, I cannot help thinking that it is wonderful how much has been done in that short period to which I allude. It was essential that something should be done to remedy the ignorant state in which the public were about twenty-five years ago. We have made great progress—there is some progress which I do not always appreciate—but this is a progress which we must all appreciate, and no one will appreciate it more than I do. Public health is one of those things which it is most important to preserve. Now-a-days large populations are congregated in cities and towns, and even in the country itself great care has to be taken in sanitary matters. Formerly no one thought of these matters as very essential; drainage, sewage, and sanitation generally, were looked upon as quite a secondary consideration. Now these things have become matters of primary importance throughout the Empire generally, and therefore, knowing as we do how essential these matters are to the general well-being, we can all be very glad that such great progress can be made. That progress is reflected in the history of this Institution. Its members and associates number 2,400, and the income last year was £6,218, and you have a capital of £11,000. It held in the year 1899, 371 meetings, which were attended by 9,364 people, besides the 45,500 who visited the Parkes Museum and Exhibition. Those figures show how general interest in the subjects you promote is augmented, and the more it increases the better it is for the public at large. You know that the public has become very advanced, and things which a few years ago were never contemplated, and never thought of, have really become household matters with them. Especially is there one great difficulty which we are feeling at the present time. The population has increased so largely, and the requirements of people in towns have been so much enhanced, that it has become a difficult matter to house them. The question is how is that problem to be solved? Well, I think that institutions like this can assist in such a work by drawing attention to the evils which exist, and by suggesting practical remedies. This is a work the Institution can well take up, and I am glad to see it is doing so, for it is well within the scope of its objects, which are to give health, and with health happiness to those who have not the power to do much for themselves. It is for institutions such as this to come and assist the feeblest section of the community, as well as to assist the Government and the Local Government in carrying out those views and wishes which the Insti-

has chiefly at heart. There can be no question that with the
of intellect, with the extension of towns and villages, and
the enormous addition to the population, which is continually
on around us, unless you have some authoritative element to
ce some general principles for the public requirements we
l be very much at a loss what to do, and the country would
y suffer. I am glad to think that the medical and other pro-
s are all having that feeling strongly impressed on their
, and they agree, I hope, with the views I entertain that such
g element ought to be encouraged and supported and assisted
ry way in our power. By promoting knowledge upon these
ts we must be treading in the right direction, and as President
Institute I gladly avail myself of this opportunity of bringing
ubject to your special attention. I am quite sure that a
ing such as this will do whatever it can to promote the useful-
f the Institution, which, in its turn, will produce the results
ost of you gentlemen surrounding me are desirous of obtaining.
I sit down I am desired to make known to you that, with a
view to advancing the consideration of the problem of the
g of the working classes, to which I have already referred,
presents so much difficulty in London and every large town,
uncil of the Institute have arranged to hold a Conference on
bject in July next, and in connection with that meeting an
tion of Models of various kinds of Dwellings will take place.
have been asked to give this notice, and I do so with pleasure,
e I think the object is one which is well worthy of support and
eration. Your Annual Congress this year has been postponed,
is Housing Conference, I understand, will, to a certain extent,
s place, and will be of great value, not only to those who take
erest in the Institution, but to those outside who are parti-
interested in that problem which will then be considered.
you, Gentlemen, the toast, "Prosperity to The Sanitary Insti-
and I have to couple with it the name of Prof. Corfield,
s at my left, and who, I have no doubt, will be able to
ore largely with the subject than I have been able to do on
ccasion.

f. **Corfield** referred to the illness of the Chairman of Council,
aw, which he much regretted had prevented his being present
vening; in taking his place in responding for the Institute he
not plead that he knew little about the Institute, as he had
member for about 24 years. In the early days of the Institute
d we used to hold our meetings in some small room, I might
call it a cupboard, at the top of a house in Spring Gardens.
oom was reached by a dark and very narrow dangerous staircase,
though it is many years since I used to mount that staircase to
l the Council meetings of the Institute, I remember to this day
nger and difficulty of the operation. Well, now we have ad-
d considerably beyond that; it is true we have not yet got a
tic staircase—but at any rate we have a safe one when we have to

get to our Council room. We have a good museum, and we have a very good house, and we are altogether, as your Royal Highness has told us, in a comparatively, if not in a very, flourishing condition. The object of our Institute is, as you know, the dissemination of *sanitary knowledge*. With regard to the work that our Institute and its committees have to do, I am informed that during last year there were no less than 148 meetings of the Council and the committees. That will give you some idea of the work that has to be done. The Presidents of the Sanitary Institute and the Parkes Museum have been His Royal Highness the Duke of Albany—the Duchess of Albany having been our Patron for many years—the Duke of Northumberland, the Duke of Westminster, and His Royal Highness the Duke of Cambridge, who, we are glad to say, is still our President. Our Institute accomplishes its objects by maintaining in the first place a permanent museum of sanitary appliances which is largely used by the public, and by the professors of classes from other teaching institutions. I may say we are entirely indebted to our Chairman this evening, His Royal Highness, for the fact that that museum is still there, and is still in our possession. By holding lectures, demonstrations, etc., for students, followed by examinations for sanitary inspectors, inspectors of meat and other officers of sanitary authorities, examinations in practical sanitary science, and in practical hygiene for school teachers, we are endeavouring to promote the objects we have at heart. Two of these examinations have been founded this year, namely the examination for Inspectors of Meat and other Foods; and the examination in Practical Hygiene for School Teachers. I may also state that these examinations are not merely conducted in London but in provincial centres throughout the kingdom. I may add that we have gone still further this year, and have now arranged for an examination in Sydney. Then in the third place the Institute has improved its opportunities for discussions on matters affecting the public health, and you know how many important questions have been discussed at the various meetings which have been held. We maintain a sanitary library and reading-room. We publish a journal quarterly containing reports of the papers read at the meetings and of the discussions which take place. This journal, I think you will agree with me, is a great improvement on the old plan of publishing transactions once a year. At the end of the year a great many of these transactions have become, so to speak, stale, and nobody is willing to read through a great book, but our present plan of publishing a journal quarterly answers admirably. By carrying out special investigations and experiments in sanitary matters we also support our work, and you will not require to be reminded of the remarkable series of investigations and experiments which were carried out by our late friend and member of the Council, Mr. Rogers Field, whose recent loss we so much deplore; and you will be glad to hear that the Council is making arrangements for having the results of that enormous series of experiments tabulated and published in a form which will be useful to sanitarians. Lastly, our Institute, by holding congresses and exhibitions in sanitary matters periodically in ncial towns, endeavours to spread a knowledge of sanitation. ;ongress held last year at Southampton, under the presidency of Villiam Preece, was perhaps the most successful one we have held. In all this our permanent staff have a great work to per- and I must not sit down without referring specially to our ent Secretary, Mr. E. White Wallis, whose admirable work ıll know and appreciate highly. I must also refer to the work r. Thompson, who has been with us for 20 years, but who is tunately ill at the present time. Such then has been the work Institute, and I will only mention one other thing in con- n with the problem of the working classes. I may remind you he Council has petitioned in favour of the Housing of the ing Classes Bill now before Parliament. This year in another ve have taken a new departure altogether. We have been in- as we have no congress in England, by the Société Française iène to hold a series of conferences in Paris, during the tion. It is arranged for these conferences to be held on the th, and 9th of August next, and we have selected those three because they are the three days immediately preceding the ıg of the International Congress of Hygiene and Demography, you will remember was held in London in 1891, and which ıis year be held in Paris from the 10th to the 17th of August. now a still more pleasing duty to perform, and that is to pro- toast, which, although it is not formally on the list, must be minds of you all. It is my duty, and I perform the task with pleasure, to propose the health of our President, His Royal ess the Duke of Cambridge, who is our Chairman this evening.)uke of Cambridge, as many of you know, has been a mem- the Institute and the Parkes Museum for nearly 20 years. s Vice-President of the Parkes Museum, and he rendered a important and signal support in a way which most of you nothing about. The Parkes Museum was on the verge of ıptcy, and it would have had to be dissolved or broken up. ›uglas Galton, who was then our Chairman, wrote a letter to Times," in which he advocated the cause of the Parkes Museum, ıowed how important it was that the public should support it, asked for that support. His Royal Highness the Duke of idge, on seeing this letter wrote of his own free will and spon- sly to Sir Douglas Galton, asking if he could do anything Parkes Museum. Sir Douglas saw the Duke in reply, and sult was that a meeting which you may remember—an im- t meeting—was held at the Mansion House, at which His Highness was present, and made a strong and eloquent speech our of the objects of the gathering. I can say without fear tradiction it was due to the ready and generous help of His Highness at that time, help given without being asked for or ıt his being approached by anyone, that the Parkes Museum ists as an important educational centre. It is, in fact, I believe, ıly institution of this kind in London. His Royal Highness en our President for several years, and in that position has attended our meetings and a congress at Newcastle-on-Tyne, and he has been present at many of its smaller gatherings. You will all agree, therefore, that the Duke has been our friend for a great number of years, in fact nearly 20 years in all, and we are grateful for what he has done for us. We hope to see him here, and to know that he is our friend still, for many years to come. I give you the health of His Royal Highness the Duke of Cambridge, President of the Sanitary Institute, and our Chairman this evening.

His Royal Highness The Duke of Cambridge, President of the Institute, said: Professor Corfield and Gentlemen, I thank you very heartily for the compliment you have paid me, all the more so as I know I am a very poor Chairman on an occasion when the Chairman ought to know a great deal more of what he ought to talk about than I have proved to you that I do. But I trust that I was not very wrong when I undertook this duty at the instance of my friend, the late Sir Douglas Galton, on account of its importance, and I only hope that I may still live to be of some use, though at my time of life I cannot look forward to very much of that. I think you will admit so far that as I am over eighty I have done pretty well. All the more so as I have not led a very idle life. When you come to think that I was for nearly forty years at the head of the army, I think you will admit that it was not a very easy task to always carry out the work which was placed upon me. One thing I am satisfied with, and that is on looking at what is going on around me, that the spirit of the army is quite as fine now as it has ever been in our time or even before that time. I venture to hope that that spirit has been inspired by those principles which I always advocated during the whole time I was at the head of the service. Many other good things have been done, and I see with pleasure that the medical service under my friend, Dr. Jameson, has been very well carried out in this great war. I saw Sir William McCormack two days ago, and had a very interesting conversation with him. I never was more pleased to hear, and also from Dr. Treves, who went with him to Natal, that they evidently had nothing to do but to assist in consultations and in special duties of their own, and that the whole of the medical arrangements of the army were really due to the department of the State which is under the care of the Director-General who has addressed us so eloquently to-night. I think it only right that I should tell you this, because I am sure you will be glad to hear that the medical arrangements have been conducted in a manner that is highly creditable to the medical officers, and highly advantageous to the service with which they are specially connected. I thank you for the high compliment you have paid me in drinking my health, and I hope that I may still be spared, perhaps for another year or two, to help you in your work. At all events I have done my best; I have tried to do my duty to this Institution; and I thank you again for the kind way in which you have received the toast of my health, and to say how fully I appreciate it.

ARTICLES RELATING TO PUBLIC HEALTH,

Appearing in the chief British and Foreign Journals and Transactions.

stracts of Titles classified in this List under the following headings:—

Science in Relation to Hygiene and Preventive Medicine.
Hygiene of Special Classes, Trades, and Professions.
Municipal Administration.
Building Materials, Construction, and Machinery.
Water Supply, Sewerage, and Refuse Disposal.
Heating, Lighting, and Ventilating.
Personal and Domestic Hygiene.

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ence in relation to Hygiene and Preventive Medicine.

LI, A. Ueber Immunität gegen Malariainfektion. *Cent. . Bakt., Parasit., u. Infektkrnkht.* Bd. XXVII., p. 107.

mmunity cannot be artificially produced either by the serum or nic juices of immune animals, nor by the juices of mosquitos, only by careful administration of euchinin or methylene blue.

ARIS-DEMEL, A. Ueber das verschiedene Verhalten einiger ikroorganismen in einem gefärbten Nährmittel. *Cent. f. akt., Parasit., u. Infektkrnkht.* Bd. XXVI., p. 530.

ulture medium stained with litmus; observation of the changes nding growth of the bacteria; possible application of the method he identification of bacteria (ex. gr. distinction of b. coli from b. osus).

CORNOTTI, E. Ueber die Häufigkeit der pathogenen Mik- organismen in der Luft. *Cent. f. Bakt., Parasit., u. Infek- rnkht.* Bd. XXVI., p. 493.

acterioscopic examination of the air in various rooms in public private houses and institutions. The dirtier the rooms the more were pathogenic organisms found. The order of frequency was: hylococcus pyogenes aureus, staphylococcus pyogenes albus, rium coli, Frænkel's diplococcus.

LI-VALERIO, BRUNO. Les puces des rats et des souris, uent-elles un rôle important dans la transmission de la este bubonique à l'homme? *Cent. f. Bakt., Parasit., u. fektkrnkht.* Bd. XXVII., p. 1.

riticism of Simond's paper (*Annales de l'Institut Pasteur*). The es of fleas infesting the rat and mouse are distinct from *pulex ans* of man.

Hankin, E. H. On the detection of the bacillus typhi abdominalis in water and other substances. *Cent. f. Bakt., Parasit., u. Infektkrnkht.* Bd. XXVI., p. 554.

The use of agar-agar stained with litmus for the identification of the typhoid bacillus. Observations on the relation of the recognition of the bacillus in water-supplies to the incidence of typhoid fever, and on variations in the virulence of the bacillus.

Koch, E. & Fuchs, G. Ueber den antibakteriellen Wert des Acrolein. *Cent. f. Bakt., Parasit., u. Infektkrnkht.* Bd. XXVI., p. 560.

Acrolein is superior to formaldehyde as a disinfectant in solution (bacteriological experiments).

Korn, Dr. Otto. Tuber Kel bacillenbetunde in der Marktbutter. *Arch. f. Hyg.*, Bd. XXXVI., Heft 1, 1899, p. 57.

Detection of tubercle bacilli in market butter.

Kübler, Dr., and Neufeld, Dr. F. The Discovery of the Typhoid Fever Bacillus in Well Water. *Minutes of Proceedings of Institution of Civil Engineers*, Vol. CXXXVII., Part III., 1898-99, p. 457.

Mankowski, A. (1.) Ein Verfahren zum schnellen und leichten Unterscheiden von Kulturen des Typhusbacillus vom Bacterium coli. (2.) Ein neues Nährsubstrat zur Isolierung von Typhusbacillen und des Bacterium coli communis. *Cent. f. Bakt., Parasit., u. Infektkrnkht.* Bd. XXVII., pp. 21, 23.

(1.) Use of stained culture medium, or of a drop of the stain on the culture to distinguish the two organisms when growing. (2.) Use of a decoction of mushrooms (with agar and peptone); b. coli grows more quickly and presents a different appearance.

Matzuschita, Teisi. Ueber die Wachstumsunterschiede des Bacillus der Hühnertuberkulose u. der menschlichen T. auf pflanz., Gelatine und Agarnährböden. *Cent. f. Bakt., Parasit., u. Infektionskrnkht.* Bd. XXVI., p. 125.

Experiments with potato, carrot, rice, and various mixtures (glycerine, bouillon, milk,) with gelatine and agar. The cultivations of bacillus of mammalian tuberculosis differ from those of the bacillus of avian t. in appearance, grow more slowly and are less luxuriant. The avain bacillus grows better than the mammalian on unfavourable media.

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MOULTON, J. FLETCHER, Q.C., M.P., F.R.S.; MATTHEWS, J. DOUGLAS, F.R.I.B.A.; PITE, BERESFORD, F.R.I.B.A. Reform in the Law of Ancient Lights. *Journal of the Royal Institute of British Architects*, 24th March, 1900, p. 209.

1. To show the lines upon which legislation should go in order to diminish the inconvenience arising from the existing rules as to rights of light.
2. To point out difficulties which architects have to experience in erecting buildings dominated by ancient lights.
3. Suggestions for reform without recourse to legislation.

"BUILDER," EDITOR OF THE. Two Theatre Fires and their Lessons. *The Builder*, 24th March, 1900, p. 285.

Description of sites and causes of the fires at Grand Theatre, Islington, and at the Comédie Française at Paris.

HEDGES, KILLINGWORTH, M. Inst. C. E. The Protection of Public Buildings from Lightning. *Journal of the Royal Institute of British Architects*, 28th April, 1900, p. 285.

Description of methods adopted in various countries.

Building Materials, Construction and Machinery.

CAWS, FRANK, F.R.I.B.A. Concrete Floors. *Journal of the Royal Institute of British Architects*, 10th March, 1900, p. 189.

Methods of constructing fire-proof concrete floors in the North of England.

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ABBA, Dr. F.; ORLANDI, Dr. E.; and RONDELLI, Dr. A. The Filtering Power of the Soil and the conveyance of Bacteria by means of Subsoil Water. *Minutes of Proceedings of Institution of Civil Engineers*, Vol. CXXXVII., Part III., 1898-99, p. 458.

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il Engineers, Vol. CXXXVIII., Part IV., 1898-99, p. 460.

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ia.

L, TH. Keimfreies Trinkwasser mittels Ozon. *Cent. f.*
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S, JOHN ALFRED, M.Inst.C.E. The Waterworks of the
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Y, Prof. Dr. E., and BRUNS, Dr. HAYO. Zur Hygiene des
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STLEY, C. H., A.M.Inst.C.E. Cardiff Water Supply.
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neers, Vol. XXII., 1898-99, p. 279.

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Vacherot. The New Dresden Waterworks. *Minutes of Proceedings of Institution of Civil Engineers,* Vol. CXXXIX., Part I., 1899–1900, p. 419.

Watson, James, M.Inst.C.E. A Consideration of the Rate per head per day of Water Supply in different Towns, and of the Causes which Increase or Diminish it in particular instances. *Minutes of Proceedings of Institution of Civil Engineers,* Vol. CXXXVIII., Part IV., 1898–99, p. 464.

Will, John Shiress, Q.C. Underground Water. *The Builder,* 17th March, 1900, p. 267.

A statement of the law upon the subject.

Wilson, C. L. N., A.M.Inst.C.E. Seven years in the Black Country. *Transactions of the Association of Municipal and County Engineers,* Vol. XXV., 1898–99, p. 39.

Description of public baths, waterworks, &c., at Bilston.

Brodie, J. S., A.M.Inst.C.E. Some Public Works at Whitehaven. *Transactions of the Association of Municipal and County Engineers,* Vol. XXV., 1898–99, p. 250.

Description of Water and Sewage Works, New Infectious Diseases Hospital, and other public works at Whitehaven.

Folwell, A. **Prescott,** M.Am.Soc.C.E. Sewer Ventilation. *Engineering Record,* 3rd March, 1900, p. 201.

Composition of sewer air.—Necessity for Ventilation.—Summary of practice in 129 American cities.

Horton, G. S. The Shone Drainage System and other Works of Felixstowe. *Transactions of the Association of Municipal and County Engineers,* Vol. XXV., 1898–99, p. 161.

Lambrechtsen van Rittem, C.L.M. The Sewerage and Flushing Arrangements of Amsterdam. *Minutes of Proceedings of Institution of Civil Engineers,* Vol. CXXXIX., Part I., 1899–1900, p. 420.

Peters. The Discharge of Heated Waste Water from Factories into Town Sewers. *Minutes of Proceedings of Institution of Civil Engineers,* Vol. CXXXVII., Part III., 1898–99, p. 461.

Savage, W. H., Assoc.M.Inst.C.E. Some Notes on House Drainage. *Transactions of the Association of Municipal and County Engineers,* Vol. XXV., 1898–99, p. 315.

C. F., M.Inst.C.E. Ten Years' Municipal Work in field. *Transactions of the Association of Municipal and ıty Engineers*, Vol. XXV., 1898-99, p. 199.

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E, H. T. The Bacterial treatment of Sewage. *The der*, 17th February, 1900, p. 161.

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ART, F. WALLIS. Principles of Sewage treatment. *Builder*, 12th May, 1900, p. 466.

cating a special form of filter with distributor sections.

HEAD, GERMAN SIMS, M.D. Sewage Sludge Disposal Natural Agencies. *Minutes of Proceedings of Institution Civil Engineers*, Vol. CXXXVIII., Part IV., 1898-99, 57.

LL, C. N., A.M.Inst.C.E. Combined Refuse Destruc- and Power Plants. *Minutes of Proceedings of Institution ivil Engineers*, Vol. CXXIX., Part I., 1899-1900, p. 181.

Heating, Lighting, and Ventilating.

INCKLE, T. W. Warming and Ventilation. *The Builder*, April, 1900, p. 396.

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KE, Dr. E. Carbonic Acid Gas, arising from the use of oleum Stoves. *Minutes of Proceedings of Institution of l Engineers*, Vol. CXXXIX., Part I., 1899-1900, p. 425.

DE, W. S. Modern Practice in Steam Heating and tilation (*con.*). *Engineering Record*, 3rd March, 1900, 05.

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Poisoning by Carbonic Oxide Gas from a Heating paratus. *Minutes of Proceedings of Institution of Civil ıneers*, Vol. CXXXVII., Part III., 1898-99, p. 464.

Personal and Domestic Hygiene.

Estcourt, C., F.I.C. Butters from various countries compared. *The Analyst*, May, 1900, p. 113.

Showing the analysis of some 250 samples of butter from Ireland, Denmark, Sweden, Germany, Canada, and Finland.

Flick, Carl. Raum-desinfektionsversuche mit dem Lingner'schen Desinfektionsapparate. *Cent. f. Bakt., Parasit., u. Infektskrnkht.* Bd. XXVI., p. 67.

Experiments with Lingner's apparatus for the production of dry formaldehyde from "glykoformal" (10 per cent. glycerine). Result, greater power of penetration, but bolsters and mattresses were not completely disinfected after seven hours.

Neumann, R. O. Die Bedeutung des Alkohols als Nahrungsmittel. *Arch. f. Hyg.*, Bd. XXXVI., Heft. 1, 1899, p. 1.

On the importance of Alcohol as a means of nutrition.

Richmond, H. Droop, F.I.C., and **Harrison, J. B. P.**, A.I.C. Notes on Sour Milk. *The Analyst*, May, 1900, p. 116.

Deals with the specific gravity, and the subject of the rate of souring.

Sachs, Dr. Willy. Carbonic Oxide Gas in Dwellings. *Minutes of Proceedings of Institution of Civil Engineers*, Vol. CXXXIX., Part I., 1899–1900, p. 424.

Schneider, Dr. Joham. Zur Desinfectionswirkung des Glycoformals unter amendung des Linguer'schen Apparates. *Arch. f. Hyg.*, Bd. XXXVI., Heft 2, 1899, p. 127.

On the disinfecting action of Glycoformal with the use of Lingner's apparatus.

Schoofs, M. François. Inconvénients des lampes fumivores hygiéniques. *La Technologie Sanitaire*, 15th May, 1900, p. 495.

Details of experiments showing the danger of formaline disinfection in sick rooms on account of the production of carbonic oxide.

Delépine, Prof. Sheridan. Experiments on Disinfection by rapid currents of Saturated Steam at low pressure, and with a new form of Steam Disinfector. *The Journal of State Medicine*, April, 1900, p. 215.

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EETINGS HELD APRIL TO JUNE, 1900.

ANNUAL DINNER.

Royal Highness the Duke of Cambridge, K.G., President,
e chair at the Annual Dinner, which was held at the Holborn
ant on May 11th. About 100 members and guests were
. Among those present were:—

v. Lord Bishop of London; Right Hon. Earl of Stamford; Sir Joseph
rer, K.C.S.I.; Sir Francis Sharp Powell, Bart., M.P.; Sir William H.
ce, K.C.B.; Rear-Admiral A. A. Fitz-George, R.N.; Surg.-General
ameson, C.B., Director-General A.M.D.; Mr. T. W. Russell, M.P.;
rman W. H. Dickinson, Chairman L.C.C.; Mr. W. Emerson, Presi-
t Royal Inst. of Brit. Architects; Mr. T. M. Rickman, President The
veyors' Institution; Dr. A. Newsholme, President Society of Medical
cers of Health; Mr. T. A. Organ, Chairman L.C.C. Tech. Education
; Mr. W. Haydon, Master of the Butchers' Company; Prof. W. H.
ield, Representing the Chairman of Council.

ort of the speeches will be found on page 338.

EXAMINATIONS.

April to June the following Examinations were held:—

PRACTICAL SANITARY SCIENCE.

7th & 28th, London.	8 Candidates,	4 Certificates granted.
8th „ 9th, Edinburgh.	1 „	1 „ „

INSPECTORS OF NUISANCES.

7th & 28th, London.	71 Candidates,	38 Certificates granted.
8th „ 9th, Edinburgh.	20 „	7 „ „
2nd „ 23rd, Leeds.	37 „	22 „ „

INSPECTORS OF MEAT AND OTHER FOODS.

h & 5th, London. 8 Candidates, 5 Certificates granted.

PRACTICAL HYGIENE FOR SCHOOL TEACHERS.

2nd & 23rd, Leeds. 13 Candidates, 11 Certificates granted.

following list gives the names of the Candidates to whom
ates were granted:—

Practical Sanitary Science.

1900, Apr. 28.	FARMER, JOHN EDWIN.
1900, Apr. 28.	FELGATE, JAMES.
1900, Apr. 28.	PICKIN, WILLIAM HENRY.
1900, Apr. 28.	SAUNDERS, JOHN SAMUEL.
1900, June 9.	WILSON, MARMADUKE TEMPLE.

Inspectors of Nuisances.

1900, Apr. 28.	ABSON, HERBERT.
1900, June 23.	ACKREL, WILLIAM.
1900, June 23.	ANDERSON, CHARLES.
1900, June 9.	BAINBRIDGE, ROBERT WILLIAM.

1900, Apr. 28.		Baxter, Hugh Steven.
1900, June 23.		Belford, James.
1900, Apr. 28.		Brown, Frank Charles.
1900, Apr. 28.		Bullock, Charles Gray.
1900, Apr. 28.		Burnett, Charles Buxton.
1900, Apr. 28.	*L*	Cann, Miss Ethel Southern.
1900, Apr. 28.		Carter, Albert John.
1900, Apr. 28.		Chancellor, William Bartlett.
1900, Apr. 28.		Chapman, Charles William.
1900, Apr. 28.		Cobbett, Frederick George.
1900, Apr. 28.		Crotty, James.
1900, Apr. 28.		Davis, Richard James.
1900, Apr. 28.		Deverill, Frank Thomas.
1900, Apr. 28.	*L*	Ditmas, Miss Euphemia.
1900, June 23.		Dowds, Thomas McGlary.
1900, June 23.		Driver, Harry Mitchell.
1900, Apr. 28.		Furnivall, Albert James.
1900, Apr. 28.		Griffiths, Arthur.
1900, Apr. 28.		Griffiths, Frank.
1900, June 23.		Haslam, Richard.
1900, Apr. 28.		Hayter, Arthur Ernest.
1900, Apr. 28.		Hedges, Frank Russell.
1900, June 9.		Henderson, William Leslie.
1900, June 23.		Hewes, George William.
1900, Apr. 28.		Hill, Robert.
1900, June 23.		Hook, Caleb.
1900, June 23.		Howe, Samuel.
1900, June 9.		Hutchinson, Edward Hall.
1900, Apr. 28.		James, Henry.
1900, Apr. 28.		James, Robert Ernest.
1900, June 23.	*L*	Johnson, Miss Harriette Annie.
1900, June 23.		Jones, Wentworth.
1900, Apr. 28.		Keeley, Robert.
1900, June 23.		Lambe, Percy Rodolphe.
1900, Apr. 28.		Langley, Herbert James.
1900, Apr. 28.		Latham, Harry Gould.
1900, Apr. 28.		March, Thomas William.
1900, June 23.		Maxwell, Thomas Homer.
1900, June 9.		Miller, William.
1900, Apr. 28.	*L*	McCleverty, Miss Elise Anne.
1900, Apr. 28.		Nash, Fountain Okey Colbourne.
1900, Apr. 28.		Newberry, Arthur.
1900, Apr. 28.		Prior, John Nelson.
1900, June 23.		Raine, John Edward.
1900, June 23.		Raistrick, Harry.
1900, June 23.		Rivett, Charles.
1900, June 23.		Rodley, Arthur.
1900, Apr. 28.		Rowsell, William.
1900, Apr. 28.		Saunders, Rowland Glave.
1900, June 23.		Scorrer, Edmund Holdridge.

1900, June 9.	SMITH, JOHN MURCHIE.
1900, Apr. 28.	SMITH, WILLIAM JAMES.
1900, Apr. 28.	SMITHSON, JOHN CARRALL.
1900, Apr. 28.	SQUIRRELL, WILLIAM JAMES.
1900, June 9.	STEWART, DONALD ALEXANDER.
1900, June 9.	SWANSON, THOMAS WILSON.
1900, June 23.	TILLOTSON, FREDERICK WEST.
1900, June 23.	TIPLADY, SAMUEL.
1900, June 23.	TURNER, JESSE JEFFREY.
1900, June 23.	WHITAKER, JAMES.
1900, Apr. 28.	WILKINSON, HARRY FELLOWES.
1900, Apr. 28.	WILLIAMS, DANIEL EDWIN.
1900, Apr. 28.	WORGE, LEWIS EDWARD.

Inspectors of Meat and other Foods.

1900, May 5.	AINLEY, EDWIN.
1900, May 5.	AUGER, WALTER GEORGE.
1900, May 5.	CROTTY, JAMES.
1900, May 5.	GREEN, WILLIAM.
1900, May 5.	SAUNDERS, ROWLAND GLAVE, M.R.C.V.S.

Practical Hygiene for School Teachers.

1900, June 23.	*L* ALLEN, Miss MARGARET.
1900, June 23.	*L* BARKER, Miss ADA.
1900, June 23.	*L* GREEN, Miss KATE LOUISA.
1900, June 23.	*L* HOLMES, Miss ROSA BEATRICE WYMAN.
1900, June 23.	*L* JOWETT, Miss HENRIETTA F.
1900, June 23.	*L* LONGBOTTOM, Miss SARAH ALICE.
1900, June 23.	*L* McKECHNIE, Miss KATE.
1900, June 23.	*L* METCALFE, Miss ZOË BLANCHE.
1900, June 23.	*L* SHARPLES, Miss MARGARET LOUISA.
1900, June 23.	*L* SUGDEN, Miss ISABELLA.
1900, June 23.	*L* TOWNEND, Miss ANNIE.

EXAMINATION QUESTIONS.

ctical Sanitary Science.—London, April 27th and 28th, 1900.

What do you understand by the terms "porosity," "capil-
," "absorptivity," and "permeability"? Give an example of

What steps would you take to neutralize the bad effects of a
subsoil before erecting a dwelling house thereon?

It is proposed to obtain a supply of water for a town by
ng a well in a stratified water-bearing formation. What points
re to be taken into consideration in regard to possible pollution
villages or farms within the area controlled by the "cone of

depression"? Illustrate the answer by sketches showing dip of strata, position of villages, &c.

4. Describe the composition of a good plaster for the walls of dwelling rooms, with reference especially to sanitation.

5. Of what materials and in what manner would you construct a roof to prevent variations of temperature within the building? Give sketches to a scale of ½ inch to 1 foot, and dimensions of the chief parts of the construction.

6. Two men at work occupy a room, with a cubic capacity of 5,000 feet, for ten hours. Calculate the size and number, and indicate the best position, of the inlets which will be required to admit sufficient fresh air so as to reduce the carbondioxide due to respiration to 0·2 per 1,000, supposing the air to enter the room at the rate of 3 feet per second.

7. What are the ordinary methods of heating and ventilating a ward of 8 beds in an Infectious Diseases Hospital? What system do you consider the most suitable and what are the objects to be aimed at?

8. Describe shortly and in order the proceedings which should be followed, and the points which should receive attention in inspecting the drainage and sanitary fittings of a house (with a cellar), which forms one of a row of houses, the w.c. being at the back of the house, and the sewer in a street in front.

The Candidates were examined vivâ voce *on the 28th.*

Practical Sanitary Science, Edinburgh, June 8th and 9th, 1900.

1. A closed vessel filled with water, the frustum of a cone in shape, is 2 ft. deep, 1 ft. 6 in. diameter at the larger end, and 1 ft. at the smaller. Compare the total pressures on the bottom when the vessel is standing on the larger end, and when on the smaller.

2. Explain how the healthiness of a dwelling is affected by
   (*a*) Aspect;
   (*b*) Position in relation to the sea-level;
   (*c*) Surrounding objects.

3. Why is so much importance attributed to the height of and changes of level in the water? Discuss some of the points connected with this question in regard to health.

4. Sketch how a well should be constructed to exclude surface contamination, where the well has to be sunk near dwellings employing cesspits, and where the land around is highly manured.

5. Explain clearly how the water in a service-main may be contaminated under the intermittent system of supply.

6. Sketch and describe in detail the construction of a hollow wall (showing the "bond"), with damp-proof course and concrete foundation, for a large building to be constructed on a damp soil.

7. Give the data for the quantity of fresh air necessary for the ventilation of living and sleeping rooms, schoolrooms, workshops,

nary and infectious hospitals. What is the limit of percentage
arbonic acid, and how is it measured?

State briefly how you would ascertain the sanitary condition of
use as regards its drainage.

The Candidates were examined vivâ voce *on the 9th.*

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nspectors of Nuisances.—London, April 27th and 28th, 1900.

What is the procedure of taking a sample of food or drugs
r the Sale of Food and Drugs Act, 1875, and to what extent is
rocedure modified by the Sale of Food and Drugs Act, 1899.

Explain how you would measure a canal boat for registration,
ow you would decide the number of persons to be allowed to
it it.

What steps should be taken to limit the spread of tuberculosis
gst the cows in a large dairy establishment where the disease
nade its appearance?

What are the objects of disinfection? Name a few of the
fectants that are generally used. How would you prepare a
1000 solution of Perchloride of Mercury?

How should rain water be stored in country houses, where it
sequently required for domestic use?

Give a neat sketch of the connections to a ground floor w.c.
description of the jointing; another w.c. is on the floor above
eed not be shown in the sketch.

Describe a "pan-closet." State what are its defects, if any,
ow those defects are overcome in more modern apparatus.
sketches of "valve,", "wash-out," and "wash-down" apparatus.

What are the reasons for paving yards adjacent to dwellings?
what power has (*a*) an Urban Authority, and (*b*) a Rural
ority in connection with such places? What are the materials
only employed, and which do you consider the best.?

The Candidates were examined vivâ voce *on the 28th.*

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nspectors of Nuisances.—Edinburgh, June 8th and 9th, 1900.

What statutory provisions exist for the purpose of taking
les of milk in course of delivery? Indicate the precise pro-
e in taking such samples.

What is the duty of an inspector with regard to smoke-
nce? What evidence is required for a prosecution?

What cubic space per head would you recommend in—

(*a*) An elementary infant school;
(*b*) A common lodging house;
(*c*) An infectious-diseases hospital?

is overcrowding to be avoided?

State briefly how you would proceed to disinfect a room of

1,500 feet capacity after its occupation by a patient suffering from—

(*a*) Small-pox;

(*b*) Phthisis.

5. What descriptions of pipes are used for conveying water wells to house cisterns? What are the advantages and disadvantages of each?

6. In inspecting plumbers' work, what are the chief points requiring attention? Sketch and explain different forms of pipe joints in plumbers' work.

7. Describe in detail how a house-drain should be laid, both in good and bad ground. Give sketches and show various methods of jointing stoneware pipes.

8. Describe the construction of a cesspool which has to be made in a very loose, sandy soil. Give a sketch showing the various points of importance to be attended to.

The Candidates were examined vivâ voce *on the 9th.*

Inspectors of Nuisances.—Leeds, June 22nd and 23rd, 1900.

1. What powers have a Sanitary Authority to enforce the proper disinfection of infected dwellings and clothing? What steps would you take to prevent the spread of infection from a case of scarlet fever occurring in a three-roomed house occupied by a family?

2. An inspector is informed of a nuisance caused by a blocked drain under a private dwelling house. Explain clearly his duties and powers to deal with this.

3. When there is evidence that any one in a district is suffering from infectious disease attributable to milk supplied within the district from a dairy outside the district, what are the duties and legal obligations of a Sanitary Authority and their Officers in such a case?

4. Do you consider filters for domestic water supplies desirable and efficacious? If so, describe the kind you would recommend.

5. How would you store for drinking purposes rain water which falls upon the slate roof of a cottage? Give the dimensions of a tank capable of holding 61 days' supply for a family of five persons, each of whom uses five gallons daily. In your answer give full details of your calculations.

6. What are the advantages and disadvantages of slop water-closets compared with (1) privies, and (2) ordinary water-closets for cottage property in urban districts?

7. Explain the chief points to which you would pay attention in inspecting the drainage of a town house connecting to a public sewer. Illustrate your answer by sketches.

Describe at least two hygienic methods of sewage disposal in places where no sewer exists.

The Candidates were examined vivâ voce *on the 23rd.*

ectors of Meat and other Foods.—London, May 4th & 5th, 1900.

What are the powers of an Inspector, with regard to unsound
, under the Public Health Act, 1875, and the Public Health Acts
ndment Act, 1890? Describe the procedure involved in dealing
diseased meat.

What are the recommendations of the Royal Commission on
rculosis with regard to the principles that should be observed in
nspection of tuberculous carcases of animals?

What diseases are communicable to man by means of (*a*)
her's Meat, (*b*) Cow's Milk, and (*c*) Shell or other kinds of Fish?

What are the following organs or parts of animals, viz.: Pelvis,
ra, Peritoneum, Sternum, Diaphragm, Spleen, Uterus, Pancreas?
their respective positions in the body.

What is meant by the following terms, viz.: Measles (in the
Gapes (in poultry), Grapes, Pearl disease, Clyers, Joint-ill,
et, Red-soldier, Trichinosis, Actinomycosis, Epizootic Aphtha.

What is meant by Pseudo-tuberculosis? In what parts of the
se would you look for evidence of the disease? Would the
se of an animal so afflicted be fit for human food?

Contrast the appearance of the flesh of an ox which had been
ed, say with a turnip, with that of an ox which had been
htered while suffering from anthrax.

Describe the condition of the flesh of a cow which had suffered
milk fever and was in a comatose state immediately before
hter.

What is meant by (*a*) chilled (*b*) de-frosted meat? Describe
ppearance of each and compare with that of home-killed meat.

. What are the characteristics of a good carcase of beef and
ibe the appearance of a section of a sirloin?

The Candidates were examined vivâ voce *on the 5th.*

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ractical Hygiene for School Teachers.—Leeds, June 22nd and 23rd, 1900.

twelve questions to be answered; the selection is left to the Candidate.

What forms of exercise and amusement for children, from
12 years of age, best meet the requirements both of physical
lopment and character formation.

What symptoms in a child who has been sent to school would
ate the existence of measles, whooping cough, and scarlet fever
ctively? How long should children living in a home where
r of these diseases has occurred be excluded from school after
ery or removal of the sufferer.

What are the early symptoms of "brain overpressure"? How
the condition be remedied without seriously interfering with a
's education?

What are the causes of "mouth breathing," and what is the
rtance of correcting it in infancy?

5. Enumerate various subsoils of sites for buildings under the following heads:—

(a) Porous.
(b) Impervious.

Underline the two which you consider most desirable.

6. State the best aspect for—

(a) School class room.
(b) Dining-room in a dwelling house.
(c) Drawing-room in a dwelling house.
(d) Kitchen in a dwelling house.

Give reasons for your selections.

7. What is meant by an intermittent supply? How is water polluted by storage? What precautions should be taken to obtain pure drinking water for school children?

8. Describe and sketch three kinds of latrines for use in schools. State the merits and drawbacks of each.

9. Sketch and describe a warm air grate or stove suitable for a class-room of forty pupils.

10. What is a suitable temperature for a school class-room? Explain fully the injurious effects of too high and too low temperatures.

11. What is a good form of school desk, and why? What points in relation to the child's anatomy should be specially considered in the design of a school desk?

12. In the ventilation of an ordinary schoolroom, what principles should govern the relative positions and sizes of the inlets and outlets? In what ways may the cold incoming air be warmed in winter?

13. Which is the best position for windows in a class-room, and why? State the advantages and drawbacks attendant on lighting by windows at the backs of the pupils.

14. What intervals of brain repose are recognised as necessary during the three hours of morning school, to allow free circulation of the blood through the body? What is the ideal method of allowing the child to employ these intervals so as to gain the greatest mental and bodily vigour?

15. What conditions are necessary for the healthy action of a muscle? Why is exercise essential to muscular development?

16. What are the functions of the skin? Describe its action in keeping the body at the normal temperature. Why is it necessary for the skin to be kept clean if good health is to be maintained?

The Candidates were examined vivâ voce *on the 23rd.*

FORTHCOMING MEETINGS.

ONFERENCE ON THE HOUSING OF THE WORKING CLASSES.

he arrangements, as far as at present arranged for the Meeting, be found in the Programme following page 380.

MEETING IN PARIS.

he arrangements made will be found in the Programme following 380.

CALENDAR, JULY TO OCTOBER, 1900.

As far as at present arranged.

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icil Meetings are held Monthly on the Second Wednesday in each Month at 5 p.m., except August and September.*

ial Purposes Committee	Third Monday at 5 p.m.
nce Committee	Second Wednesday at 4.30 p.m.
ibition Committee	First Monday at 5 p.m.
gress and Editing Committee	Second Monday at 5 p.m.
eum and Library Committee	Fourth Monday at 5 p.m. (except December).
nination Committee	Fourth Friday in April, 6 p.m.
amentary Committee rs Pollution Committee Inspectors Exam. Committee	As occasion requires.

JULY.

Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Cardiff.

Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Liverpool.

Examination for Inspectors of Meat and other Foods, Liverpool.

Conference and Exhibition of Plans and Models on the Housing of the Working Classes.

AUGUST.

Bank Holiday. Start for Meeting in Paris.

Conference Meetings to be held in Paris in conjunction with the Societe Francaise d'Hygiene.

SEPTEMBER.

he Course of Lectures and Demonstrations for Sanitary Officers will commence about the middle of September. The complete list will be published in the next Journal, but copies can be obtained at an earlier date on application.

FELLOWS, MEMBERS, & ASSOCIATES ELECTED.

May and June, 1900.

(*A complete list can be had on application.*)

Reg. No. Date of Election.

FELLOWS.

1900. May. **Melliss**, John Charles, M.INST.C.E., 264, *Gresham House, Old Broad Street, E.C.*

1900. June. **Worth**, John Edward, M.INST.C.E., *London County Council, Spring Gardens, S.W.*

MEMBERS.

S Passed Examination in Practical Hygiene for School Teacher.

1393 1900. May. **Bottomley**, W. B., M.A., PH.D., F.L.S., F.C.S., *Professor of Botany, King's College, W.C.*

1404 1900. June. **Crump**, Edward Harold, *Council Offices, Nuneaton.* (*Cert. Assoc. M. and C.E., Assistant Surveyor to the Nuneaton and Chilvers Coton U.D.C.*).

1405 1900. June. **Dalton**, James Henry Chesshyre, M.A., M.D., D.P.H. CAMB., *Cranmer House, Cambridge.*

1394 1900. May. **Dandy**, Joseph Henry, *Chief Sanitary Inspector, Hong Kong.*

1406 1900. June. **Dewhirst**, James, *The Laurels, Great Baddow, Chelmsford.* (*Surveyor and Engineer, Chelmsford R.D.C.*),

1395 1900. May. **Grant**, William Francis, M.D., D.P.H.LOND. AND CANTAB., 159, *Edgware Road, W.*

1396 1900. May. **Kershaw**, G. B., 16, *Bessborough Gardens, S.W.* (*Engineer to Royal Commission on Sewage Disposal.*)

1407 1900. June. **Littlewood**, John O., M.R.C.S., L.R.C.P.LOND., D.P.H., M.O.H., *Mansfield, Notts.*

1397 1900. May. **Marshall**, Augustine, M.D., D.P.H., M.R.C.S., L.R.C.P., L.S.A., M.O.H., 145, *London Road, S. Lowestoft.*

1398 1900. May. **Mason**, Wm. P., *Troy, New York, U.S.A.* (*Prof. of Chemistry, Rensselaer Polytechnic Institute.*)

1399 1900. May. **Matthews**, Douglas Samuel, 650, *Fulham Road, S.W.* (*Architect and Surveyor.*)

1408 1900. June. *S* **Ravenhill**, Miss Alice, 3, *Cleveland Gardens, Ealing, W.*

1400 1900. May. **Russell**, Chas. Henry, D.P.H., M.R.C.S., L.R.C.P.LOND., M.O.H., *Great Yarmouth.*

1401 1900. May. **Sapp**, John George Victor, M.B., C.M., M.R.C.S., L.R.C.P., D.P.H., 16, *King William St., Strand, W.C.*

Date of Election.	
900. May.	**Smith**, Edmund Moody, M.D., C.M.EDIN., D.P.H.CAMB., M.O.H., 62, *Scarcroft Road, York.*
900. May.	**Thomson**, Theodore, M.A., M.D., D.P.H., *H.M. Inspector Local Government Board, Whitehall, S.W.*
900. June.	**Wrack**, William P., 117, *High Street, Poplar, E.* (*Cert. Assoc. M. and C.E., Assistant Surveyor to the Poplar District Board of Works.*)

ASSOCIATES.

‡ Passed Examination for Inspector of Nuisances.

900. May.	‡**Bevan**, Willie, 16, *Cistern Street, Totnes, Devon.*
900. June.	‡**Nightingale**, Henry, *Corley Hall, near Coventry.*
900. June.	‡**Nichols**, James Charles, 28, *Devonshire Street, Accrington.*
900. May.	‡**Sanderson**, Thomas, 129, *Caunn Street, Blackpool.*
900. June.	‡**Severn**, Charles, 6, *Albert Street, Hucknall, Torkard.*
900. June.	‡**Willan**, Robert William, 88, *Church Street, Pendleton.*

EXHIBITS ADDED TO THE MUSEUM,

APRIL TO JUNE, 1900.

lsbach Lights. A glass case with Lamp fitted with various kinds f burners and styles of globes.
The Welsbach Incandescent Gas Light Co., Ltd.

ecting Pendant. 3-Light Welsbach Incandescent Burner fixed ı Science Room. *The Welsbach Incandescent Gas Light Co., Ltd.*

inomycosis. Bones of Head of Cow, showing extensive ravages f the disease. *J. King.*

'siological Models of Trunk, Head, Eye, Ear and Foot.
Purchased.

omatic Flush Tank for Urinals, with glazed fire-clay parts.
J. Duckett & Sons.

k. Glazed earthenware on Pedestal of same material. The 'edestal rests on the floor and is provided with an extension at ack for fixing into wall. The Pedestal being hollow allows for he concealment of waste pipe and trap. *Skey & Co.*

h. End section of a Vitreous Enamelled Iron Bath, with hot nd cold supply valves, and removable standing waste and overflow.
Doulton & Co., Ltd.

CONTRIBUTIONS AND ADDITIONS TO LIBRARY

April to June, 1900.

⁂ *For publications of Societies and Institutions, &c., see under "Academies."*

ACADEMIES (British).

London. *Association of Municipal and County Engineers.* Proceedings, Vol. XXV., 1898–99. General Index to Vols. I.—XXV., 132 pp. 480 pp., 8vo. London, 1899. *The Association.*

——— *Howard Association.* Leaflets on "Housing of the Poor and its Amelioration," "The Rural Exodus," and "Back to the Land," Demark's example. *The Association.*

——— *National Association for the Promotion of Technical and Secondary Education.* Twelfth Annual Report, 1899. 88 pp., 8vo. London, 1900. *The Association.*

——— *Society of Engineers.* Transactions for 1899 and General Index, 1857–1899. 300 pp., 8vo. London, 1900. *The Society.*

——— *The Institution of Civil Engineers.* Minutes of Proceedings, 1899–1900., Part I. 511 pp., 8vo. London, 1900. *The Institution.*

Army Medical Department. Report for the year 1898, with Appendix, Vol. XL. 591 pp., 8vo. London, 1900. *The Director General.*

Beachcroft, *R. M.* The Housing of the Poor. (Paper read at Church Congress, London, Oct. 1899.) 7 pp., 8vo. *Prof. W. H. Corfield, M.A., M.D.*

Berne, *Statisque de la Suisse.* Mouvement de la Population de la Suisse pendant l'Année, 1898. 32 pp., 4to. Berne, 1900.

——— *Statistique de la Suisse.* Résultats du Dénombrement des Enfants faibles d'Esprit en âge de fréquenter l'école, y compris ceux qui sont atteints d'infirmitiés physiques ou qui sont négligés et moralement abandonnés: enquête qui a eu lieu en Suisse au mois de mars, 1897, 11ᵉ partie. 99 pp., 4to. Berne, 1900. *Bureau de Statistique.*

Bombay Improvement Trust. Administration Report for the year ending 31st March, 1900. 20 pp., 8vo. Bombay, 1900. *Hon. W. C. Hughes, M.Inst.C.E., Chairman.*

Bowditch, *Henry I., M.D.* Preventive Medicine and the Physician of the future. 60 pp., 8vo. Reprint, Fifth Annual Report State Board of Health. Boston, 1874.

——— Is Consumption ever contagious, or communicated by one person to another. 14 pp., 8vo. Boston, 1864.

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1 Epidemics in Massachusetts, 1868–9. 14 pp. Extract, Trans-
ions American Medical Association. Philadelphia, 1869.

—Electrolysis in Thoracic Aneurism. 11 pp., 8vo. Reprint,
loston Medical and Surgical Journal," Jan. 20th, 1876.

— Studies of an Epidemic of Diphtheria which prevailed at
rrisburg (adjacent to Vergennes) U.S., during the summer of
'7. 15 pp., 8vo. Reprint from Transactions of the American
dical Association, Philadelphia, 1878.

— Sanitary Hints. 11 pp., 8vo. Reprint, Seventh Report of
ssachusetts State Board of Health. Boston, 1876.

—Topographical Distribution and Local Origin of Consumption
Massachusetts. 154 pp., 8vo. Medical Communications of the
ssachusetts Medical Society, Vol. X., No. 11. Boston, 1862.

— Memorial Meeting, Report of. 40 pp., 16mo. Reprint from
"Boston Medical and Surgical Journal." August 25th, 1892.
Vincent G. Bowditch, M.D.

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h Année, par le docteur, E. Janssens. 41 pp. 8vo. Bruxelles,
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the sterilising properties of unconfined superheated steam.
p., 16mo. Reprint from *Lancet*, February 3rd, 1900.
J. H. C. Dalton, M.D.

1 and Cornwall *Branch Association for the prevention of
sumption and other forms of Tuberculosis.* Report on Tuberculosis.
., 8vo. Plymouth, 1900. *The Association.*

n, *J. H. C., M.D.* Small-pox in its relation to Vaccination,
l other means designed for its prevention with a critical
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Prof. W. H. Corfield, M.A., M.D.

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er, *Wm., Assoc.M.Inst.C.E.* A Comprehensive Treatise on the
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existing Waterworks. Fifty double Plates and 250 Illustra-
s. 378 pp., fol. London, 1896. *Lady Galton.*

rn, *Dr. Hyac.* De l'anchylostome duodénal en général et de sa
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The Author.

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Local Government Board. Report to, on Enteric Fever in the City of Chichester, by Dr. Theodore Thomson and Colonel J. T. Marsh, R.E. 26 pp., fcp. London, 1899. *The Board.*

——— Twenty-Eighth Annual Report, 1898–99. Supplement containing the Report of the Medical Officer. 588 pp., 8vo. London, 1899. *W. H. Power, F.R.S.*

Manchester. Report *re* Deputation of School Board to Sanitary Committee on Measles and the Closing of Schools, with Report by J. Niven, M.A., M.B., M.O.H. 68 pp., 8vo. Manchester, 1899. *Prof. W. H. Corfield, M.A., M.D.*

MEDICAL OFFICERS OF HEALTH AND OTHER SANITARY REPORTS.

Ashwell R.D.C., 1898 & 1899.	*Bushell Anningson, M.A., M.D.*
Aylesbury U.D.C., 1899	*C. Hooper, M.O.H.*
Birmingham, 1899	*Alfred Hill, M.D., F.R.S.Edin.*
Blackpool, 1899	*A. Jasper Anderson, M.A., M.B., D.P.H.*
Bridlington Borough & Rural S.A., 1899	*W. A. Wetwan, M.R.C.S.*
Brighton, 1899	*A. Newsholme, M.D., F.R.C.P.*
Cambridge, 1898 and 1899	*Bushell Anningson, M.A., M.D.*
Chesterfield R.D.C., 1899	*Herbert Peck, M.D., D.P.H.*
Chesterton U. & R.D.C., 1898 and 1899	*Bushell Anningson, M.A., M.D.*
Coventry, 1899	*E. Hugh Snell, M.D., B.Sc.*
Crewe, 1899	*Meredith Young, M.D., D.P.H.*
Dundee, 1898	*Prof. W. H. Corfield, M.A., M.D.*
Eccles, 1899	*J. H. Crocker, M.D., D.P.H.*
East Ham, 1899	*A. W. Beaumont, B.A., M.D.*
Edinburgh, 1899	*Prof. W. H. Corfield, M.A., M.D.*
Ely R.D.C., 1898 and 1899	*Bushell Anningson, M.A., M.D.*
Exeter, 1899	*J. Woodman, M.D., F.R.C.S.*
Finchley, 1899	*H. Kenwood. M.B., D.P.H.*
Gibraltar, 1899	*Maj. H. P. Elkington, D.P.H., R.A.M.C.*
Gosport & Alverstoke, 1899	*E. J. Hunter, L.R.C.P.E.*
Handsworth U.D.C., 1899	*J. Richmond, M.A., M.B.*
Hunslet, 1899	*Joseph Buck, M.O.H.*
Lanark County—Lower Ward (San. Insp.), 1898 & 1899	*A. Hay.*

len and Winstree R.D.C., 99	*J. W. Cook, M.D.*
estoft, 1899	*A, Marshall, D.P.H.*
ourn R.D.C., 1898 & 1899	*Bushell Anningson, M.A., M.D.*
castle-upon-Tyne, 1899	*H. E. Armstrong, D.Hy.*
port, 1899, and **Newport S.A.,** 1899	*J. Howard-Jones, D.Sc., M.D.*
Windsor, 1899	*E. Casey, M.D.*
of London, 1899	*W. Collingridge, M.A., M.D.*
ate (San. Insp.), 1899	*J. P. Humphery.*
adda U.D.C., 1899	*H. Jones, L.R.C.S.I., D.P.H.*
r Tyne P.S.A., 1899	*W. E. Harker, M.D., B.Hy.*
ston U.D.C., 1898 & 1899	*Bushell Anningson, M.A., M.D.*
ves (Hunts) and Swave- y R.D.C.'s, 1898	*Bushell Anningson, M.A., M.D.*
ves (Hunts) R.D.C., 1899	*Bushell Anningson, M.A., M.D.*
Mary, Stoke Newington, 99	*H. Kenwood, M.B., D.P.H.*
lave's District, 1899	*W. A. Bond, M.A., M.D., D.P.H.*
ey C.C., 1899	*E. C. Seaton, M.D.*
vesey R.D.C., 1899	*Bushell Anningson, M.A., M.D.*
lring and U. & R.D.C.'s, 99	*J. W. Cook, M.D.*
t Bromwich, 1899	*Herbert Manley, M.A., M.B., D.P.H.*
cester, 1899	*Mabyn Read, M.D.*

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sey and Irwell Joint Committee. Report by R. A. Tatton, .Inst.C.E., March, 1900. 15 pp. 8vo. (Plates.) Manchester. 00. *The Author,*

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— Proceedings and Addresses at a Sanitary Convention held at raverse City, Michigan, August 22nd and 23rd, 1889. 105 pp., vo Langsing, 1900. *The Board.*

lard, *C Killick, M.D., D.Sc.* Infant Sacrifice, or why should abies die. 20 pp., 8vo. London, 1900. *Prof. W. H. Corfield, M.A., M.D.*

ional Association for the Prevention of Consumption. Report f the First Statutory General Meeting, May 4th, 1899. 21 pp., vo. London, 1899. *Prof. W. H. Corfield, M.A., M.D.*

bit, *D. M.* Presidential Address to Institution of Heating and entilating Engineers, May 1st, 1900. 11 pp.

— Warming and Ventilation. List of Works completed and n progress, with a short description of the "Leicester Plenum" ystem. 70 pp., 4to. London, 1900. *The Author.*

wsholme, *A., M.D., F.R.C.P.* A Contribution to the Study of pidemic Diarrhœa. 73 pp., 8vo. Reprint from "Public Health." ec., 1899. *Rebman, Ltd., price 2s. 6d. (publishers).*

Ontario. Report relating to the Registration of Births, Marriages, and Deaths, in the Province of, for the Year ending 31st Dec., 1898. 227 pp., 8vo. Toronto, 1900. *The Board of Health.*

Paris. Annales des Ponts et Chaussées 1re Partie. Mémoires et Documents relatifs à des Art Constructions et au service de l'Ingenieur, 1899. 4^{e} Trimestre. 348 pp., 8vo. Paris, 1900. *L'Inspecteur-général Secretaire de la Commission.*

Parkes, *L. C., M.D., D.P.H.* Report to Vestry of Chelsea on the Prevention of Tubercular Diseases. 6 pp., 8vo. London, Feb., 1899. *Prof. W. H. Corfield, M.A., M.D.*

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Smith, *G. Bellingham, M.B., F.R.C.S.*, and **Washbourn,** *J. W., M.D., F.R.C.P.* The Infectivity of Malignant Growths. 14 pp., 8vo. Reprint "Edinburgh Medical Journal.' January, 1900. *Prof. W. H. Corfield, M.A., M.D.*

Snell, *H. Saxon, F.R.I.B.A.* Charitable and Parochial Establishments. 70 pp., fol. (Plates.) London, 1881. *Lady Galton.*

Southport. *Meteorological Department.* Report and Results of Observations for the year 1899, by Joseph Baxendell, F.R.Met.Soc. 28 pp. 4to. Southport, 1900. *The Author.*

Stockport. Health Reports, 1893—1900, by Charles Porter, M.D., D.P.H. 8vo. Stockport. *The Author.*

Sydney. Report of the Chief Medical Officer of the Government and President of the Board of Health, New South Wales, on the case of A. P. (Plague). 8 pp. fcp. Sydney, 1900. *J. Ashburton Thompson.*

Whyatt, *H. Gilbert, Assoc.M.Inst.C.E.* The present position of the Sewage Purification problem. 24 pp., 16mo. Reprint, "The Sanitary Inspector's Journal," February, 1898. *The Author.*

OTES ON LEGISLATION AND LAW CASES.

se notes are copied by permission from The Law Reports published by he Incorporated Council of Law Reporting for England and Wales. full text of these see Law Reports, which can be referred to in the ibrary of the Institute.

K.—*Adulteration—Written Warranty—Contract to Supply Milk in Instalments—"Milk to be Pure New Milk"—Whether a Warranty within the Act—Sale of Food and Drugs Act, 1875 (38 & 39 Vict., c. 63), s. 25.*

s. 25 of the Sale of Food and Drugs Act, 1875, "If the dants in any prosecution under this Act prove to the satisfaction e Justices. . . . . that he had purchased the article in ion as the same in nature, substance, and quality, as that nded of him by the prosecutor, and with a written warranty to effect," he shall, under certain other specified conditions, be ed to be discharged from the prosecution.

on the hearing of an information against the respondent for g, contrary to the provisions of the Act, sold on December 15th, certain milk to the appellant which was not of the nature, ance, and quality demanded of him by the appellant. The ndent relied on an agreement in writing dated January 20th, by which a farmer agreed to sell to the respondent 1,000 s of milk weekly, "the milk to be pure new milk":—

ld, that, even if the agreement amounted to a warranty within eaning of s. 25, there must be some evidence in writing to that the particular milk sold to the appellant was purchased that warranty, and that in the absence of that evidence the ment afforded no defence to the respondent.—(ROBERTSON *v.* is.) Div. Ct., 2 Q. B. [1900] 117.

) **AND DRUGS.**—*Adulteration—Compounded Drug—Sale of Food and Drugs Act, 1875 (38 & 39 Vict., c. 63), ss. 6, 7.*

sale to the prejudice of the purchaser of a compounded drug, is not of the nature, substance, and quality of the article nded, is an offence under s. 6 of the Sale of Food and Drugs 1875, and proceedings for the recovery of a penalty may be under that section.—(BEARDSLEY *v.* WALTON & Co.) v. Ct., 2 Q. B. [1900] 1.

VACCINATION.—*Order—Non-compliance with order—Burden of proof—Vaccination Act, 1867 (30 & 31 Vict. c. 84), s. 31.*

Upon the hearing of a summons under s. 31 of the Vaccination Act, 1867, against a parent of a child for non-compliance with an order of justices directing him to have his child vaccinated, the burden of proving non-compliance is upon the prosecution. Evidence that the certificate of vaccination required by the Act has not been received by the proper officer is *prima facie* evidence from which non-compliance with the vaccination order may properly be presumed.

OVER *v.* HARWOOD. Div. Ct. 1 Q. B. [1900] 803.

DRAINAGE and SEWERAGE.—*Metropolitan Drainage System—Agreement to admit Foreign Sewage—Public Body—Injunction—Ultra Vires—Estoppel—Laches and Acquiescence—Metropolis Management Act, 1855 (18 & 19 Vict. c. 120), ss. 135, 138, 140, 250—Metropolis Management Amendment Act, 1862 (25 & 26 Vict. c. 102) s. 61.*

Under s. 61 of the Metropolis Management Amendment Act, 1862, the vestry of a parish within the Metropolitan area cannot, even with the consent of the London County Council, enter into a binding agreement to receive sewage from a district without the metropolitan area.

The reasoning of Vice-Chancellor Hall in Metropolitan Board of Works *v.* London and North-Western Railway Co. (1880), 14 Ch. D. 521; [1881] 17 Ch. D. 246, approved:—

Where the plaintiffs, the vestry of a parish, within the metropolitan area, made an arrangement with certain landowners of a district without the metropolitan area (now represented by the defendants, the urban district council) whereby the discharge of some sewage from the defendants' district in a sewer belonging to the plaintiffs had been permitted for many years, and this additional sewage had increased so as periodically to choke up the plaintiff's sewer:—

Held, that this arrangement operated in law merely as a revocable licence, and that the plaintiffs, being a public body with public duties to perform, were not estopped or precluded by laches or acquiescence from bringing an action for an injunction to restrain the defendants from using the sewer; but

Held, that, having regard to the conduct of the plaintiffs and to the difficulty in which an injunction would place the defendants in compelling them to close their sewers, the Court only ought to make a declaration that the defendants were not entitled to send sewage from their district into the plaintiffs' sewer without the consent of the plaintiffs. (ISLINGTON VESTRY *v.* HORNSEY URBAN COUNCIL), Court of Appeal, 1 Ch. [1900] 695.

ERS.—*Prescriptive right of Drainage—Trade Effluents—Polluting Liquid—Public Health Act, 1875 (38 & 39 Vict., c. 55), ss. 17, 21—Public Health Acts Amendment Act, 1890 (53 & 54 Vict., c. 59), s. 17, sub-sec. 1.—Rivers Pollution Prevention Act, 1876 (39 & 40 Vict., c. 75) ss. 4, 7, 16—West Riding of the Yorkshire Rivers Act, 1894 (57 & 58 Vict., c.* clxvi.), *ss. 9, 10.*

ıere the owners of Buildings have acquired a right to discharge ıge into a public sewer through a connection lawfully made, right extends to the discharge of trade and manufacturing nts, and the provisions of s. 7 of the Rivers Pollution Preven-Act, 1876, do not justify a local sanitary authority in cutting ıe connection with their sewer, even although it is shown that ischarge of a trade effluent prejudicially affects the disposal of wage matter conveyed through the sewer.

e decision of Justice Charles in Peebles *v.* Oswaldtwistle Urban cil [1897] 1 Q, B., 384, on this point followed.

ASTWOOD BROTHERS LIMITED *v.* HONLEY URBAN COUNCIL.)

stice Byrne, 1 Ch. [1900] 781.

ıme XXI.—Part III.] [October, 1900.

JOURNAL
OF
THE SANITARY INSTITUTE.

NFERENCE ON THE HOUSING OF THE WORKING CLASSES.

HEALTHY AREAS AND DISPLACEMENT OF TOWN POPULATION.

INTRODUCTORY REMARKS BY THE CHAIRMAN,

R. MELVILLE BEACHCROFT, L.C.C.

July 30th, 1900.

ERENCE is made in the Programme of the Conference to pinion expressed by Mr. T. W. Russell to the effect that n the general election comes on, this question of how to e the people will be one of the great issues upon which election will be fought.

ay I express the hope that this will not be so, but that the tion will be recognized as a non-party one; surely no one, Ir. Robert Reid said the other day, can desire to make y capital out of the miseries of other people.

greeing then, as we probably all do, with H.R.H. the ce of Wales, that there is no question at the present time reater social importance than this, and lamenting with him greater progress has not been made in the solution of the ulties which surround the question, we may well devote days to the discussion and consideration both of these ulties and the way in which they may be surmounted.

o-day we shall confine ourselves to unhealthy areas and lacement of population, leaving until to-morrow the wider perhaps more interesting, question of improved house mmodation and means of communication.

do not wish to occupy your time unduly, or stand between you and those who are going to address you, but you will doubtless expect me, in opening the proceedings, to make a few general observations from the stand-point of an amateur, who has devoted some years on the County Council to the special study of the subject as it affects the metropolis.

The completion by the London County Council of their Great Boundary Street Improvement, which involved the diplacement of 5,400 of the labouring class, the clearance of fifteen acres of slum property and the substitution of a model colony of municipal dwellings for fifteen acres of dirty hovels, is in itself an event which not only invites but demands criticism. For a time it was believed that the results achieved were not such as to justify a repetition of clearances on a similar scale, but a year or two ago two other large areas, viz., one in Somers Town, and another in Clare Market, were initiated and are now in course of being dealt with, whilst quite lately three new schemes have been adopted, involving further large displacements, so that additional heavy calls upon the ratepayer in the same direction may be immediately looked for. It is therefore most desirable every opportunity should be given and taken for analytical discussion of the operation of the existing law in the matter of treatment of unhealthy areas.

Whatever conclusion may ultimately be arrived at, it may perhaps be taken as satisfactory that the net cost of the clearances effected so far by the L.C.C. compares favourably per head with that incurred by the M.B.W.

The Board of Works carried out twenty clearance schemes, displacing 25,217 persons at a net cost of £59 per head, while the cost per head of clearances effected by the Council under the Housing Act, works out at about £50 a head—the difference may fairly, I think, be attributed to the special compensation provisions of the Housing Act of 1890—in fact the Council's valuer has more than once stated that the effect of those provisions is to make it anything but a profitable transaction to own slum property required under the Housing Act—on the other hand, every large clearance by the London County Council must involve the buying out not only of the slum owners but of trade interests and it is this which causes the loss to the ratepayer. The commercial value of land in the central districts when cleared is always largely in excess of its value as site restricted to the erection of dwellings. For example, the sites on which the existing dwellings of the Council have been erected by them stand in their books at a total value of £95,000 while the commercial value is estimated by their valuer at £230,000; the difference between these two figures represents the cost which has to be borne by the rates.

'arious remedies have been suggested and doubtless they
be referred to to-day.

[r. Blashill will, I hope, explain to us his scheme for com-
ng owners of areas hereafter pronounced insanitary, to form
ıselves into a syndicate, and for casting the onus and cost of
·ance upon them. Other methods may possibly be suggested
giving Freeholders, whose Lessees stand in the way, the
t of re-entry, so as to overcome a difficulty which London
holders, such as H.R.H. the Prince of Wales, experience,
g to intervening interests created by Leases.

o doubt there will be found followers of Mr. Asquith and
Stuart, who look to an adjustment of Local Taxation
ıe direction of charging all rates on to land apart from
lings as a means both for relieving the present incidence of
:ost of improvements, and for cheapening suburban land;
lastly there may be those who agree with Lord Rosebery
the only real way to settle this and other social questions
appoint a dictator "who can see what is to be done, and
"

ıe question whether the present method of dealing with
althy areas is the best is not however purely a financial
but largely depends on the effect this method has on the
:rowding difficulty.

must be a disappointment to everyone, whether philan-
ıist or sanitary reformer, that so few of those displaced
find their way back into the new dwellings erected for
, and I confess personally to an inability to accept as even
ılly satisfactory the assurance of the political economist,
the provision of a high standard of house accommodation
ıces a general shift, and serves to raise the standard all
l. The fact remains that a mere fraction of those living
e Boundary Street area at the date of the scheme in 1890,
) be found in the new dwellings and that none, so far as I
ıscertain, of the Clare Market tenants, who were to be
lered as provided for by the buildings the Council has
ed at Millbank, have been willing to migrate to them and
he rents demanded.

e question put by Lord Rosebery, "What is to be done
the residuum which you displace?" has still to be an-
:d.

is easy to pass a resolution, as the County Council did a
nonths ago, that in future they will find accommodation
number equal to those they displace, but not so easy to
displacement until new accommodation is provided; the
lies in providing accommodation for those displaced who
t to be accommodated on the spot before the actual dis-

placement, and, in my opinion, no clearance scheme should be allowed to pass which fails to make this provision. These persons belong naturally to the poorest class, and in the new buildings hitherto provided, the rents are too high for them and the restrictions too great.

I have expressed my own views before on this branch of the subject and shall not hesitate to do so again.

As overcrowding is the cause of an area becoming insanitary, it follows that a strict application of the law against overcrowding ought, in at all events the great majority of cases, to effect the required cure.

If an area is found actually unfit for human habitation, instead of buying it up, the local authority should be able to insist that the houses on it shall cease to be occupied until the area has been reconstructed. The owners would then be driven to find the means of reconstruction themselves, and the only duty, condemnation once made effectual, that would then devolve upon the local authority would be to see that accommodation is found for those displaced, whose business necessitates residence on the spot.

Experience shows that a very small proportion of those living on an insanitary area actually need to live on the spot (out of 6,000 disturbed in connection with the new street from Holborn to the Strand, only 774 belonged to the class whose work rendered residence on the spot a necessity) and our Borough Councils who will now have the same power that the London County Council has of providing dwellings under Part III. of the Housing Act ought to be able, with the knowledge at their disposal, to meet the wants of these.

I do not, of course, suggest that cases may not arise where a clearance scheme by the central authority under Part I. of the Housing Act on the same extravagant lines as heretofore is rendered necessary by special circumstances, but I do say that such cases in London should now be very exceptional, and that it is not so much unhealthy areas that require treatment as unhealthy houses.

I notice, with pleasure, the recent circular of the Local Government Board reminding local authorities generally of the very large powers they possess for securing the proper sanitary condition of all premises within the area under their control, and although recent decisions may go to prove that amendment of some kind of Part II., as well as of Part III., of the Housing Act is required, the fact remains that if the existing law against overcrowding is but rigorously enforced, not only will there be no unhealthy areas to deal with, but a stop will be put to the influx of population and rents will go down.

:ecent returns show how few houses in London, compara-ly speaking, occupied by members of more than one family, registered and under proper inspection, we cannot wonder ı that overcrowding continues. What is wanted is a lual but certain enforcement of existing powers, so that nately every house of the kind referred to may be under er inspection.

should like to add in conclusion, that so far as the opolis is concerned, the danger ahead of us is not so much to deal with unhealthy areas within our border, but how :event them from being created just outside that border.

is high time that both the London Building Act and the lic Health (London) Act, 1891, were made applicable to icts within say twenty miles of London and other populous ıs.

have said enough, however, by way of introduction, and now leave the matter in the hands of the conference, in :arnest hope that the beneficent object of the Council of Sanitary Institute in calling us together, viz., the advance-t of the consideration of this great problem, may be fully ned.

r. T. **Blashill**, F.R.I.B.A. (London), remarked that his ification for addressing the conference was the fact that twelve or thirteen years he had been architect to the opolitan Board of Works and the London County Council. ıe point before them was that the cost of their clearances £50 per head, and they had nevertheless not replaced the le dishoused. To his view that was the cardinal considera- Now the only remedy that he could suggest was that down in a paper read at the Congress of the Sanitary tute, held last autumn at Southampton. In that paper ad advocated that in future instead of purchasing property paying compensations and so on, the L. C. C. should keep its :y for the purpose of compensating those persons compelled ave the insanitary area, and who must of necessity be re-ed elsewhere, if possible on a site as near as possible to the ite, say within a radius of a mile and a quarter. There few of the residents but could carry on their business in a walk of twenty minutes of their old home. Many d be able to move to a greater distance and would have to easonably compensated together with payment of their :lling expenses. If the local authorities had not to spend :y in buying property they would be in a position to look after those persons who had to be removed. He would take family by family and rehouse them at suitable distances, paying if necessary something extra in order to get the accommodation required. The local authority would make up the difference say for three, five, or seven years between the rents the people had to pay and what they had been paying, and allow suitable compensation for travelling expenses. The total sum would not amount in the end to one-fourth of £50 a head. In fact £12 10s. per head would be an extravagant estimate. There would be no excessive trouble for the people were scheduled now, and what was spent would be small in comparison with the present expenditure.

Now, with regard to the area itself, he would buy none of the property, nor would he compensate any of the owners. What was to be done with it? In the first place directly a local authority had decided that an area was an unhealthy one, it should be impossible for any owner to admit another person upon his premises. Of course improvement could not be made at once, it would take time. Gradually the population decreased, some were removed by the local authority, others went of their own accord, some died, and so on. From the very first day the area would begin to improve. The great obstacle to the improvement of slum areas was that there were so many owners of the property. On great estates where there was only one owner, improvements of bad areas could be easily carried out, and were carried out by the landlord himself.

Now what he had suggested was a scheme for the relief of the numerous owners by putting them in the same position as the one. Let them form a trust under the supervision of the Government, and when they had done that let them rebuild the houses, widening the streets and generally improving the area according to the existing law. If the local authority wanted any property for improvements, public buildings or parks, it would probably be the first and best customer of the trust. At the end the land would be worth a great deal more than it was before in its slum condition. It was in that mean and neglected state because it did not belong to one owner who could do as he liked with it; he proposed to give to the associated owners the powers and privileges of one owner. Now the municipality had to buy the property at great cost, a cost which under his plan would be obviated. Those who desired to know further details of his suggestion would find it in the records of the Southampton Congress of the Institute,* and he trusted it might receive the consideration which he ventured to think it deserved.

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* "Journal of The Sanitary Institute," Vol. XXI., Part I., page 1.

Councillor W. **Holder**, M.R.C.S. (Hull). said that there s little need to remind the audience that Part I. of the using of the Working Classes Act, 1890, was as much con- ned with the reconstruction of new and hygienic homes l areas as it was charged with the destruction of houses and as which have become effete and sanitarily defective.

On the other hand it was needless to remind the audience t Part II. was more concerned with the demolition of insani- y dwelling places, leaving their reconstruction to the re- rces of those who have lived on their decay.

The Corporation from which he had the honour to be delegated ked upon Part I. as cumbersome and costly. It shunned its uiries, arbitrations and provisional orders as unnecessarily ious, and its awards and reconstructions as costly and un- sonable. It looked upon these arbitration awards as unjust the honest ratepayer whilst they were often a too generous t to avaricious and unprincipled owners of nauseous and vdy properties, who had often fatted on a cent. per cent. ital on their first capital charges, and who on the awards, uld not be judged on their primary costs, but more likely their unwholesome present over-inflated rentals and re- rns.

With such fears and feelings it was therefore not a matter for prise that his corporation preferred to carry on its cleansing d reforming work by the more direct and reasonable restric- ns of Part II., through which it had been enabled more quickly, d under a simpler and it thought more reasonable machinery, clear away not only unhealthy individual houses, but as he uld hereafter show, considerable areas of filthy and degene- ted dwelling houses which had been a menace to the moral well as the public health of the town.

It was obvious from the foregoing that there was little sym- thy with an unworthy section of property owners, and yet was principally on behalf of a section of the property owners at his Committee wished him to urge some action being taken amend Part II. of the Act. They desired this not altogether a matter of equity or justice, but rather on the grounds of pediency mingled with pity.

During the last year, in the town of Hull, the unhealthy vellings sub-committee of the Sanitary Committee had been eadily using Part II. of the Act to demolish and remove the orst insanitary localities and houses of the town. This part the Act had enabled them to pull down some ninety-six uses, which covered a considerable area. In these parti- ılar houses the entire area covered per house appurtenances id back and front areas, worked out at about 31 square yards per plot. Now under the Bye-laws in force in Hull, and sanctioned by the Local Government Board, the least area in front and back of any new building was 2½ more square yards for the front area and back yards alone, than was covered by the house and areas in those plots of which he had spoken. It was therefore obvious that as no modern house could be built on any of these plots, the land, if owned by a single owner, was comparatively of no value for use or ornament. As a single plot no plan could be built on it. Many of these owners were partly dependent on the rents they received from those houses, and though owners had no right to do what they do persist in doing, viz., to live on gross rentals as income, and ought to put away, for re-construction, a reserve fund; yet his Committee had been compelled to feel a latent pity for some of those owners who had no means. They desired to help them to make the best of their denuded and too small plots, and further, they desired to circumvent the number of land vultures who hover around, not to buy, for that was a too generous term, but to acquire those too small plots at a price unfair to the owner of the freehold. How could that be done? It might be pointed out to him that Clause 39 of Part II. gave the power to corporations to rearrange areas. That was true, but his corporation saw no need to be made responsible as buyers, owners, or builders, by arbitration or otherwise for those areas. They avoided it by refusing to adopt Part I., and they wished to avoid it by Part II. It might be asked how they would avoid it? He should say they would take no action, as they were now willing to do, but await the action of the informer, and then, instead of being the willing aider, they would feel the sting of injustice to themselves in loading their authority with properties and litigations which they thought might better be dealt with otherwise, and for this reason Clause 39 was not in favour. His corporation, though willing to help the freeholder to do the best he could with his or her land, was unwilling to be hampered with its ownerships, and the many disputations and imputations which its acquirement would entail. Having stated the position they took, the audience then were entitled to ask what was suggested.

Their plan was that the land when in singles and unusable plots were by the Corporation pooled together with other neighbouring and unusable plots for the benefit of the freeholders or maybe leaseholders, though such leaseholders were almost unknown in Hull. The corporation surveyor rearranged the areas into saleable plots and advertised them for sale by tender or public auction as the sanitary committee of a corporation might decide. The proceeds were awarded to the owners of the ts upon an agreement between themselves, and in case of ir disputation, by a majority composed of an equal number themselves and members of the sanitary committee of the rn. The details, however, could best be decided by the fting agents for the amendment, if the legislature would ept the suggestion. He then had the pleasure to submit for judgment of that conference another desirable amendment; s was, that on change of ownership, after proceedings were nmenced, the property should only be sold subject to the al steps already taken being endorsed on the contract of sale. at was necessary because instances had occurred where pur- sers had bought without knowing closing orders were being ained for the properties.

The next amendment of the Act found desirable was that when e the first action for closing of an insanitary dwelling was pted, no evasion of the subsequent demolition order should permitted if the premises could not be made sanitarily safe a dwelling house.

They were being much hampered now by legal gentlemen ising their clients that they could avoid a closing order by verting what was a dwelling house into a stable, office or rehouse. It could easily be imagined that an obstructive owner ld prevent an entire renewal by placing a stable in the middle a number of demolished houses. In many places slum perties existed in the best neighbourhoods of business centres. e enforced demolition of the whole, benefits the owners, ause in the place of the rookery the area was entirely denuded ts foulness, and it became opened out for the better class of perties and erections, and yet this might all be upset by the ion of one owner converting an old, decrepit slum house in centre of this plot into a stable. This should not be missible.

Another amendment would be the enlarging of the definition "dwelling house," when it was defined as "any inhabited lding" the restriction enables an unlet dwelling house to nd as a menace to the respectability and renewal of ghbouring houses. The Act itself was not readable clearly ler this definition, for it made clauses 29 and sub-section 2 irely ambiguous and thus opened out unnecessary contention l litigation. A wider definition was therefore a desirable endment, and therefore his committee asked for aid in those endments.

Dr. R. Sydney Marsden, F.R.S.Ed. (Medical Officer of alth, Birkenhead), observed that it seemed to him the first ng required to be done in connection with this rehousing question was to give the local authority greater freedom of action; secondly, a reduction of the costs of the preliminary enquiry, which was often extended to unparalleled length, and in his opinion was to a large extent unnecessary; then there was the application of the Public Health (London) Act, 1891, to the country, giving the authorities powers of supervision over all houses which had more than one family. This would give them power to enquire into circumstances of suitability and adaptability of the houses for the purposes for which they were being used, and there ought to be powers given to insist on partial reconstruction where necessary. A point which required attention was that of dealing with small areas, with regard to which they were limited in every way. There are some areas with houses which cannot be *made* sanitary under Part II., but the ground on which they stand is too small for them to be dealt with under Part I. of the Act, as it is impossible to give the necessary rehousing insisted upon by the Local Government Board.

His next point was the dealing with the residue of people who occupy insanitary areas. At present they provided only for the respectable portion of the working classes, who really did not require so much looking after, but the people who were reducing healthy areas into insanitary ones were not touched at all; if they were moved they only went and made another area insanitary. He did not think that any Act which did not give them compulsory powers to deal with the residuum of the people themselves would be satisfactory. They ought to have some power of control over those persons who render themselves an absolute danger to the community at large, and the only way in which they could get that would be by the provision of municipal dwellings, which should be under municipal control and sanitarily policed, and those people should be compelled to live in them until they were fit to live in respectable houses. He thought this was a practical point—the provision of municipal dwellings of the type he had indicated, with washhouses, etc. If they were going to compel the people to be clean they must provide them with the means to keep clean. He believed something of this kind of house had been attempted in one or two places—Edinburgh, for example—and he should like to hear the result of the experiment. It was evident that at the present time there was a large number of the more respectable of the lower classes which were as yet unprovided for, as is proved by the rapidity with which houses built under the Acts are filled up. These will have to be properly housed first, otherwise they will always be competing with the lower stratum for any properly-constructed dwelling.

JOHN F. J. SYKES, M.D., D.Sc. (M.O.H. St. Pancras). d the most difficult thing in considering the housing of the rking classes was to view the several aspects in their proper portion and relationship to each other. In the few minutes mitted he proposed to briefly review these under the heads movement of population, unhealthy areas, overcrowding, and itation curative and preventive.

MOVEMENT OF POPULATION.

The movement of population in a city may be general or al. GENERAL MOVEMENT OF POPULATION takes place by: *Influx* of resident population by attraction from the country o the city; (2) *Recession* of resident population by expulsion m the centre of the city towards its periphery due to the gencies of commerce; (3) *Compression* of resident population ı middle zone where the two movements meet. The influx m the country is shown by the census returns, and that it takes ce in London from the periphery towards the centre is well picted in Mr. Charles Booth's map in Vol. II. of his "Labour l Life of the People." The recession is seen from the Census urns and district statistics, the expulsion being caused by the growth of commercial and industrial pursuits and pre- ses; (2) the extension in roadway and railway of the means transport and transit; and (3) the multiplication of public l quasi-public buildings.

LOCAL MOVEMENT OF POPULATION takes place by: (*a*) *Dis- cement* of resident population by (1) the conversion of dwell- g-houses into offices and workshops, and (2) the demolition of elling-houses for street improvements, for railway extensions, l the erection of new offices, warehouses, workplaces, and ier buildings. (*b*) *Circulation* of resident population by the nolition of unhealthy dwelling-houses in groups and areas, l the erection of new dwellings. The number displaced by this t cause is very small compared to the large masses displaced other causes. The circulation takes place in this manner: e least favoured elements of the population which have con- ntrated in the unhealthy local centre are by demolition persed through the surrounding zone, and the effect of onstruction is, that the new houses built upon the site attract e most favoured elements from the surrounding zone.

UNHEALTHY AREAS.

Unhealthy areas may be considered from the points of view origin and remedies. The origin of an unhealthy area or oup of houses is generally remote, and may be usually traced to the following conditions: (1) *Streets, courts, and alleys originally* so narrow or tortuous, or obstructed, or at such a gradient or so low-lying, as to be now regarded as unhealthy for the houses abutting upon them; (2) *houses originally* so badly placed or arranged, or planned or built, as to be now regarded as unhealthy; (3) *houses ultimately* so aged and decayed or dilapidated as to be unhealthy.

The remedies applicable to unhealthy areas. These conditions may be dealt with under the Housing of the Working Classes Act—(1) *in large areas* by street improvement and rearrangement of street-blocks of houses; (2) *in small areas* by reconstruction of street-blocks or groups of houses; and (3) *individually*, by the demolition of a house here and there.

OVERCROWDING.

The effect of the movement of population is to cause compression and overcrowding, especially in the middle zone of a large city.

The overcrowding of houses upon area is a feature entirely distinct from *the overcrowding of population in houses.* The former is due to original *errors of construction*, generally committed in the old villages and suburbs swallowed up by the growing city, and their repetition can be prevented by good Building Acts and Bye-laws; the latter is due not to construction but to *errors of usage*, brought about by the pressure of population from within and from without the city.

The effects of the overcrowding of population in houses are, firstly, to render the condition of originally unhealthy areas or groups of houses worse, and to make the application of remedies more urgently demanded; and secondly, to cause areas and groups of healthy houses to be rendered unhealthy by altered usage, many families being crowded into houses intended only for single families.

SANITATION.

The measures required for dealing with insanitary areas and with overcrowding are (1) curative and (2) preventive.

(1) *Curative sanitation* has hitherto almost solely been relied upon as a remedy: (*a*) in demolishing insanitary areas and reconstructing buildings for housing the whole or part of the displaced persons, and (*b*) in helplessly awaiting the results of overcrowding upon further areas and repeating the same remedy.

It must be admitted that some areas, by reason of originally bad arrangement and construction, and by dilapidation, must timately be demolished and rebuilt, either voluntarily or mpulsorily; but it must also be admitted that there are some eas better arranged and constructed that may be prevented om being brought into dilapidation through overcrowding and ered usage, and here there is scope for preventive sanitation, stage upon which we are only just entering.

(2) *Preventive sanitation*, like all other preventive measures, only possible when causes and effects have been studied and iced through their several stages. We have now reached the ige at which we can fully recognise what effects we can event; they are (1) the crowding of persons into rooms, and) the crowding of families into houses. The preventive easures applicable to these conditions are: (*a*) the building of ditional houses in the outskirts of the large city, and the provement of the means of transit from the centre, so as to aw off the pressure of population. The more favoured class ll form the majority migrating to the suburbs, and will cate houses or parts of houses in healthy areas; (*b*) the aptation of the houses in some of the healthy areas of the y vacated by the more favoured class to the requirements of e less favoured, by converting them into flats. This move-ent of population is not assumed, it will be recognised by all one that actually happens naturally and cannot be arrested, e wisest method is to direct it into its best course.

If an ordinary eight-roomed terrace house in the middle zone London is taken and its descent traced, it is found that has been successively occupied by four different classes:) the well-to-do family, which originally occupied all the ght rooms of the house; (2) the comfortable, that later on was ntent with half the house; (3) the struggling, that shared it floors or quarters; and (4) the casual family, that lives its e in one room. The method of dealing with those who termine rather than are driven to live in one room and bury emselves in dark and insalubrious places is more a social than sanitary question, and depends more upon education than on construction. Thus the usage falls from one stage to other without any adaptation of the structure to the altered rcumstances. The house is subdivided into flats by usage but t by structural adaptation, and it falls by destruction into a ndition requiring constant attention and repair, and possibly timated emolition, voluntary or compulsory.* Many tene-ented houses are capable of being converted into passable flats complete on each floor, and of being spared for many a long year for useful service to the community. Large numbers of houses in wide and airy streets with ample space at the rear, vacated by the more comfortable classes, who are migrating to the suburbs, are capable of being adapted and converted into flats for the proper needs of the more struggling classes who enter and occupy them.

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* Note by Speaker.—Lord Provost Chisholm stated later in the pro-edings of the Conference that in Glasgow the demolition of an unhealthy ea did not result in so crowding the dispersed population into the sur-unding area as to render it also unhealthy. This was due to every dwelling

Under Part III. of the Housing of the Working Classes Act, 1890, a Local Authority may convert any buildings into dwelling-houses for the working classes, and may alter, enlarge, repair, and improve the same respectively. No effort has been hitherto made to do this. This will not provide additional buildings because it is not a curative measure, but it will provide decent accommodation that will prevent the deterioration of houses in respectable neighbourhoods, that eventually follows when the population is driven by the force of circumstances to invade them in mass. It will prevent the herding together of human beings under conditions that shock our present day ideas, and that lead those who do not grasp the position to cry out that Local Authorities do not put the Public Health Acts or the By-laws for houses let in lodgings or separate dwellings into force. The public has yet to learn that these Acts and By-laws do not touch the question, and they are altogether inadequate to meet the case. Let the public show a little prescience as to what must arise when houses are being more and more sublet in fragments, and endeavour to avert the degradation of family life amongst the masses that must inevitably follow.

Local Authorities can show this prescience, and the new London Boroughs have here a task worthy of their best endeavours, to prevent deterioration and degeneration, and raise the standard of the existing dwellings of the mass of the working classes, especially in the more open parts of the middle zone of London.

But much as Local Authorities may hope to do, their greater work will be in showing by example what can be done in this direction by converting some existing houses into presentable flats as object lessons, rather than in attempting the task of acquiring and improving *all* such houses. It is private owners, individually or associated, who must be depended upon to carry out such a work, if it is to be done on any large scale.

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and flat in Glasgow being already so adapted by the provision of appurtenances complete on each floor that they did not permit of further sub-division. But in London there is no finality to sub-division until the one-room dwelling is reached, and there is no provision for the adaptation of single vertical houses to multiple horizontal dwellings.

ey will not do it except on business principles, they must tain the money. What provision is made for them to obtain

Under Part III. of the Housing Act, loans are granted to vate persons entitled to the land in fee simple for an absolute m of more than fifty years for the purpose of improving ellings for the working classes. Now we must recognize the t that landowners have no power to deal with the houses on ir land until the leases expire, and that leasehold house-ners only possess this power, although, in many instances, y are not the persons who sublet the houses in subdivided ements. But how many leasehold house-owners are there o possess houses complying with the requirements of the blic Works Loan Commissioners for borrowing purposes, l how many are likely enough to incur the expense essary to adapt their houses to the requirements of life flats, "pour les beaux yeux" of their tenants and ground dlords? they are not all philanthropists, even if they could rd that luxury. Even the offer made to them of exemp- from inhabited house duty, under the Customs and Inland enue Acts, 1890 & 1891, has not induced them to move this direction; on the one hand the monetary inducement nsufficient, and on the other the pressure of sanitary legisla- in this direction is *nil*.

r. Sykes laid great stress upon this necessity for adapting ement houses to the usage to which they are put, namely, that eing let in flats, as he was firmly convinced, after fifteen years' erience, that it is of paramount importance. The working ses drifted into the cities, and there entered largely into sub- unadapted tenemented houses, where their healthy family life undermined with the worst consequences. The maintenance healthy, vigorous, virtuous family life was a great national onsibility, and a great effort should be made to convert e lodgings into family dwellings; whether by monetary pre- m, by subsidy, or by compulsion, was a question for the itician, not for him.

e asked for the serious consideration of this question of PTATION for the sake of healthy family life, for the welfare the children, the citizens of the future, and the backbone of nation.

r. COOPER (Aberdeen) said that the city of Aberdeen had moted various clearance schemes in Parliament under sec- II. of the Housing of the Working Classes Act, but it had n a most costly system and not entirely satisfactory. In case of the Exchewin Row area, while the area, as a whole, was insanitary, many of the houses within the area were not insanitary, and all that was wanted was to have the unhealthy ones removed and leave the healthy ones. In connection with their schemes a large number of persons were unhoused, and they were building houses on the tenement principle for, perhaps, 500 or 600 people in order that they might be able to deal with the unhoused population which came every year. In Aberdeen they did not deal on the weekly system but year by year. There was a demand annually for a large number of single roomed and two roomed houses, but while he believed a great improvement had been effected by the provision made for this class of tenant in the housing of the city generally, still it was not the best thing that could be done, because, while the houses erected were better than the people could get under other conditions, still there was the same tendency towards overcrowding which was always inseparable from tenement dwellings. One thing they tried to do to prevent the overcrowding of ground was to get Parliament to give them power to declare that the streets should be fifty feet wide, and perhaps some of those present would have noticed the arguments used against their getting such powers. It was said, "We don't have fifty feet streets in London, and we manage with the narrow streets." In Aberdeen we have obtained powers to fix on fifty feet streets.

One thing which appeared to him to be of the greatest importance was the question of the period of repayment of money borrowed under section III. of the Act, and he was strongly of opinion that it should be prolonged to something like an approximation of the longevity of the house itself. In a scheme at Aberdeen they had to repay the price for the ground and also for the building of the houses in thirty years, and consequently they were not able to let those houses so cheaply as perhaps they might have done. By promoting a clause in a local act they had got an extension of the period to fifty years, but even that was not long enough. He considered that any house, if the timber put into it was not half rotten to begin with, would last at least one hundred years, and he did not see why the present generation should make provision so much for the future—it did not require a cynic to ask the question, "What has posterity done for us?" If they had power to widen the streets and a longer time in which to repay the borrowed money, it would give them a better chance of solving the problem.

Mr. GODBOLD (West Ham) said he felt somewhat reluctant to address a meeting of that character. He was only after all abour representative, but still he felt very earnest with his leagues of the West Ham Town Council with regard to that :ticular question. It was a difficult problem when they came take into consideration that 60,000 families were living in ndon with only one room each. Unfortunately they had l a large number of discussions on the housing question, but, far, no really practical solution of the difficulty had been ived at. He had had experience in regard to that great ›stion. Some people had suggested to him that they should ry the workers from the city out into the country, and charge m the same rent, but that he did not think would meet with agreement of the working classes generally, especially en it was remembered that the average wage for the London ourer amounted to less than a guinea a week. They found t they could not afford to build houses in West Ham to let ı less rent than 8s. 6d. a week. As far as he was concerned did not want to cater for the people who could afford to that amount of rent per week. It seemed to him that of all they wanted to diminish or prevent the erection of :ories occupying large sites in congested areas. That certly ought to be stopped at the earliest possible moment. what had the London County Council done for West m? The action of the London County Council in dis-.sing people without providing adequate accommodation ›nsified the question of unhealthy areas and over-crowding West Ham, much to the satisfaction of the slum property ıer, who was able to charge any rent he liked for his proty. With regard to the question of compensation, he was d of hearing about compensation for the owners of house perty; they had already been compensated over and over in in the way of rent from their poor tenants.

ome of the speakers had alluded to the question as to how leal with a bad class of tenants, and some even said they e scarcely worth housing at all. But there they were, and question was: what were they going to do with them? sooner they changed the environment of these people, and e them proper houses with plenty of air space, thus making ir lives more encouraging and healthful than it is to-day, better, and he believed they would get a better class of ınt almost at once. He was Chairman of the Public Health nmittee of his Council last year, and people attacked him ause he did not advocate the abolition of slum property, he could not advocate that course of action under the sent circumstances, as it would be absolutely playing into hands of the landlords.

irst of all, he would bring about the erection of municipal houses, but the great difficulty, of course, was the paying of 3½ per cent. and only having 40 years for the repayment of the loan. Under such circumstances it was almost impossible to do anything practical in that direction. He thought the Conference was likely to be of no effect unless they could get an expression of opinion that loans for such purposes should be extended over a much longer period. To his mind it was on that matter alone that the whole question hung, and then they wanted to be able to borrow at something less than 3½ per cent. Under the present circumstances they could not build houses for the people, and while they could not build houses for those who were displaced he could not approve of the abolition of insanitary areas.

A delegate asked what the people got for their 8s. 6d. per week in the way of accommodation.

Mr. **Godbold** explained that in the proposed double-tenement houses the ground-floor tenement would contain one living room, two bedrooms, and scullery, with bath; and the first floor one living room, three bedrooms, and scullery, with bath.

Mrs. **Maurice Dockrell** (Deputy Vice-Chairman, Blackrock, Co. Dublin) said she would emphasize more particularly the difficulties of small districts. The gentlemen present were so accustomed to deal with large areas and to spend large sums of money, that they could scarcely realize how much more complicated this question of housing became in smaller areas and with a small rateable valuation.

One of the great difficulties was to find out who were the owners of this slum property, and what she would like to urge was compulsory registration of slum property owners. If every municipality had a list of such owners, and if every change of ownership was at once notified, it would be an advantage.

Another difficulty when dealing with insanitary areas, was what to do with the people who were displaced. Her experience was that when such areas were cleared these people pressed into the surrounding districts and never came back into the dwellings that the local authority built in place of those they had demolished. In her township the Urban Council had cleared an insanitary area and built some cottages as well as a block of artizans' dwellings at a cost of £15,000, which represented yearly a loss to the township of £300, and she did not think that any further loss in this direction should be encountered by the rates. Being a woman she looked to the ratepayer's interest sometimes, and consequently she hesitated before embarking upon any more artizans' dwellings.

She would like to see temporary accommodation provided for
ose that were displaced, and that when the new buildings
re erected the former tenants should be put into the houses
ilt by the local authority, otherwise they were occupied by a
gratory class from the surrounding townships, thus penalizing
ratepayers of the more progressive, enlightened, and philan-
ropic district.

Mr. H. H. Collins, F.R.I.B.A. (Paddington), observed that
thirty-five years he had been connected with the parish of
ddington and had been associated nearly all that time with
nitary and Assessment Committee, upon which questions
nected with the housing of the poor frequently occurred.
The first speaker, he thought, seemed to consider the question
if the people were all so many pieces of wood or chessmen to
moved about at his pleasure, but he was delighted to find
t subsequent speakers spoke on the question from a non-
nfiscatory point of view. The point which had led him to
and address them was that in his practice he was called
n a short time ago to make a valuation of a property at
llesden Junction, and, it seemed to him, that in a large
asure the question they had been discussing, had been solved
re. On the other hand, it seemed to him that what the
ndon County Council was doing was absolutely and positively
permanently locate and conglomerate the population at every
nt where they intervened. He need only take for example
Boundary Street scheme. Every one would say that they
l done well there and had laid out splendid streets, and built
ital flats, giving ample accommodation and every sanitary
vision that people could possibly desire. But what had they
e? They had fixed that population for once and for all,
l they had planted all the different industries in that locality
ever, and in progress of time he was afraid that posterity
ld not bless the London County Council for its present
ion. But what had they done further on? There was no
ge manufacturing population in Clerkenwell, but they had
ght a brewery there; they had reasons for it he would
nit, but they gave something like £210,000 for that site.
himself had offered £160,000 for the property for the
pose of erecting warehouses, and he was surprised when he
told by the auctioneers that there was an offer of £200,000
it, for at that time it was not known that the London
nty Council were negotiating for the site. He thought the
ndon County Council had done a distinct wrong there,
after they had cleared the area at an enormous expense—at
h an expense that no surveyor would advise a client to take

the land at the price the London County Council paid for it (if he wanted to make a profit)—they proposed to erect artizans' dwellings, and by so doing they were creating a working population in that particular neighbourhood. At Willesden Junction he found to his great astonishment a whole series of manufactories—"cabinet makers," "engineers," and a variety of others. He found that those manufactories had been moved from the London centre down to that place and they were not only carrying on a very extensive business but they were buying the property, and the only trouble that arose was that they had a difficulty in obtaining sufficient labour because there were very few artizans' dwellings there. Now land there was, of course, infinitely cheaper than anything that could be got in the centre of London, and the opportunities for housing people there—not warehousing them as they were doing in these model dwellings—were very great, for they could provide accommodation for them under the same conditions as they would like to be themselves. There were opportunities for putting up houses like they had done in West Ham where a man could have self-respect, because his self-respect was self-contained in his own dwelling. He would point out also that a small garden could be provided and then there were some opportunities for the people to enjoy the amenities and pleasures of life. All that was being done at Willesden was done voluntarily. He expected that some of them in the room knew that a large number of manufactories had been or were being taken away from the centres of London into the suburbs. For instance, Allen's the printers, had a large establishment built at Harrow, and there were many others he could mention. There was no difficulty about it because with a small office in the city and telephonic communication, firms could execute their orders with the greatest facility and quite as well as if their works were on the spot. That seemed to him to be the best means of obviating some of the difficulties connected with this housing question. By getting manufacturers to shift out of the great centres they would get rid of the difficulty of transit—the difficulty of light railways and railway charges on ordinary railways, because the people would be located where they were wanted. What he thought the London County Council and Municipal authorities should do was to try and get manufacturers to move their factories out from the crowded centres to the suburbs, and if that were done the question would be in a large measure solved.

THE HON. THE LORD PROVOST OF GLASGOW (Mr. Samuel Chisholm) said that in Glasgow, like Aberdeen and other places, ey had felt that the Housing of the Working Classes Act was cumbrous and so costly that it was practically inoperative, and addition to that, they had been advised by their legal lviser that the machinery provided by the Housing of the orking Classes Act differed in many respects from the achinery provided under certain of their local private Acts, d that for Glasgow to adopt the Housing of Working Classes ct would lead to an absolute dislocation of their whole siness, and therefore they had been compelled to go in for ivate Acts.

In regard to unhealthy areas, the difficulty they experienced s that they could only get an area pronounced unhealthy by ming to Parliament for each individual area, having every use, tenant and occupant, registered and scheduled, and ving every tenant and occupant an opportunity of coming to rliament and opposing the measures. What they would like do was this: they would like to have a provision whereby a al and inexpensive authority could decide on the question as what was an unhealthy area. Being experts, he need not to them that there was a difference between an unhealthy use and an unhealthy area. An unhealthy area might have althy houses in it, and it was the existence of those healthy uses in an area which was their greatest difficulty, and it s owing to those healthy single houses in an unhealthy area at they had all the trouble of going to Parliament: and after ey had been before two committees in Parliament, the cision after all was given by those who knew practically tle or nothing of the question on which they decided.

They in Glasgow felt that when the borough architect and e medical officer for the city and the chief sanitary inspector reed that a given area was insanitary, their decision should final, subject only to an appeal to such a local authority as Scotland they called the Sheriff. He knew that the Sheriff cupied a different position in Scotland to what he did in gland, but undoubtedly a similar authority under a different me could be secured in England. They felt that if they re able by some such inexpensive methods as that to pro- unce an area insanitary, the Corporation of Glasgow would ready immediately to take possession of that insanitary area d to rebuild on it such housing accommodation as they eded. Glasgow had done a good deal in that matter already. ey had two City Improvement Acts, and one of them dated ck a considerable period, but the other was of very recent te. They had expended a sum amounting to considerably er one million of money in purchasing property and demolish- g it, and in the re-erection of other houses.

A voice: Is the salt market the place?

Yes: salt market was one of the places, but they had done it more or less over the whole length and breadth of the city, and they had erected houses for the working classes to the number of something like 3,000 to 4,000, and retained the property in the possession of the Corporation.

He could not say they kept the same tenants; as during displacement the tenants removed, and, as had been stated, the tenants did not come back, and he might say they did not expect them to come back. But they did not necessarily go to form slums in other districts. He was afraid that was a mistake which many entertained. The process which took place was this: the Corporation was bound to build houses of a high sanitary character, and the houses so built were occupied by a class that was just exactly suited for them, and the people removed to these houses and left empty other houses. The people who were displaced went to the houses which were left empty by the people who came to the Corporation houses, and those houses were much higher than the slums which were cleared away. Therefore he did not regard with the pessimistic views of some people the fact that they did not get back precisely the same class of people as they formerly had.

It had been said that no Corporation had ever addressed itself to the subject of reconstruction. Well, Glasgow had in addition to this demolition and erection, reconstructed a considerable number of dwellings. They had reconstructed a number of buildings which in the opinion of the Committee at the time were not sufficiently bad to warrant entire demolition, and yet were not sufficiently good for tenant occupation. They had expended a few thousand pounds in reconstructing existing buildings, so that houses which used to be occupied by one or two families were now separated into houses of two or three and in some cases one apartment, and were kept up to the highest state of sanitary requirement and were occupied by poor people. In addition to that they had under their recent Act obtained power to purchase land within or without the municipality, and on the lands that they might acquire to erect dwellings for poorer classes, and they were at present in the course of carrying out these powers. They had bought ground on the very outskirts of the city at a very low price, and they were contemplating erecting and were busy arranging plans for erecting on those acquired sites, houses—and possibly cottages—with little gardens behind them. They were expected to accommodate the very poorest of the poor and he hoped at some future conference they would be able to report their success in carrying out the important matter on which they had entered. He trusted that the conference would not end without some expression of opinion, and that the organisers of the meeting had prepared some resolutions which they would submit as carrying out the views at which the conference had arrived.

Dr. SYKES asked if it were not a fact that what was called a house in Glasgow was what they called a flat in London.

Mr. CHISHOLM replied that it was not even a flat. It was an occupancy. It might be a single room, or two, three, four, or five rooms, but it was occupied by a single family. In their tenancy system two or three families might enter and reside on one floor, but on that floor they were provided with every convenience.

Dr. SYKES: That is the reason why in Glasgow the people turned out do not create an insanitary area, and it is the reason why they do in London.

Alderman LUPTON (Leeds) stated that in Leeds plenty of new houses were provided each year by private builders, and the Corporation were in the happy state of not having to interfere. The reason was that they had practically no leases in Leeds; it was almost all freehold, and there was abundance of competition by private builders. They were now dealing with an unhealthy area of 90 acres, but before they pulled a single dwelling down they had provided for 900 people on neighbouring land which belonged to the Corporation, and which the Corporation sold at something like half the real value, on condition that houses were built on it according to the Local Government Board plans. The depreciation was owing to the restrictions imposed by the Local Government Board, and the Corporation took this course believing that the first loss was less than if they had built the houses and let them themselves.

He believed they would have no difficulty with the Housing of the Working Classes Act as far as Part I. was concerned, but he ventured to think that Part I. of the Act was not that which would be of most value to them in Leeds. In the Parkes Museum would be found the plans of a small area with which they had dealt, and which originally consisted of back-to-back houses, the spaces or yards between being filled with other houses and outbuildings. What they had done was to take away the intervening houses and outbuildings, leaving two wide courtyards entirely open from end to end of the area. They had also dealt with a number of single houses in courtyards and so on, and pulled them down and allowed air space. They were going on with that, and he believed that they would benefit ten times the number of houses that they pulled down.

One remark at which he had been rather surprised was that in dispersing the tenants in an unhealthy area they created new slums, but it seemed to him that Corporations had power to prevent that. In many cases he knew that houses had been built before the Corporations had building bye-laws, but that was their fault in not getting bye-laws soon enough. A great many unhealthy areas arose through Corporations not putting their powers into force. They could prevent overcrowding within the houses themselves; they had bye-laws amply sufficient if only they would put them into force. As to overcrowding of buildings he was afraid that where they had allowed houses to be built in unsuitable places they would have to pay for pulling them down. They had powers to prevent unsuitable houses being built, and he could not understand why Corporations did not put those powers into force, and prevent such houses being built, and new unhealthy areas being made.

J. Douglass Mathews, F.R.I.B.A., F.S.I. (London), said that in the few minutes allotted to him he should confine his remarks to dwellings for the very poor, as it was for that class that it appeared to him provision was most necessary.

The majority of the so-called working classes were skilled artizans, who were as well able to pay a house rent commensurate with their earnings as the clerk or small tradesman, and, except to distribute the population over a wide area by facilitating means of conveyance to and from their work, he saw no reason to interfere with the ordinary supply in houses suited to their requirements.

In the very poor he included those non-skilled persons who earn very low wages, those whose employment was precarious, and also the dissolute and impecunious, who all have families to support, and from their small earnings cannot pay a sufficient rent to afford a fair return for capital expended in building suitable houses. It was this class of persons whose work necessitated their residence in or near large centres, who had neither time nor money to expend in travelling, and now had to live in worn-out houses unfit for habitation; and to enable them to pay their rent one room was often occupied by several persons, the fruits being disease, immorality, and vice.

The task he had set himself was to solve the difficult problem of providing dwellings suitable for such persons, at a cost which would not necessitate charity on the one hand or pauperism on the other, and which would prove also a sound commercial investment.

To popularise dwellings of this description the habits and prejudices of the poor must be considered, and some improvement in what they were accustomed to, would be more readily accepted by them than the ideal plan of a reformer.

In the plans that were exhibited three classes of tenements were provided: No. 1, a one-room apartment with bed recess, to be let at 2s. 6d. per week; No. 2, a living-room with parents' bed-room and cubicle for a child, and also scullery, to be let at 4s. per week; No. 3, a living-room with parents' bed-room, two cubicles for children, also scullery and detached W.C., to be let at 5s. 6d. per week.

Each of the suites opened direct from the landing of a fireproof staircase—in the centre of the building—and were all fitted with a ventilated food cupboard, dresser, coal store, and sink, which also served the purpose of a lavatory.

The chief feature in the plans was that each tenement was self-contained, and the sleeping places opened out of the living-room. The parents' bed-room was sufficiently large for all practical purposes, and was enclosed the full height of the room. The cubicles were large enough for sleeping and dressing, and the enclosure next the room was only 6 ft. 6 in. high, thereby allowing cross ventilation. As the fireplace in the living-room would be constantly in use, the chimney would be a valuable extractor of foul air.

The buildings were designed in height and space to accord with the London Building Act, so that every portion would be amply lighted, and good play-yards provided in the rear. The requirements of the Public Health Act were also respected.

The cost of the erection of **A** plan (page 407), containing twelve suites of rooms, including living-room, parents' bed-room, two cubicles, scullery, and W.C., was estimated at about £2,000.

The cost of the erection of **B** plan (page 407), containing similar accommodation to **A** but on a somewhat smaller scale and only one cubicle, and also twelve single rooms, was estimated at £2,300.

The method of construction was of the simplest character, at the same time it was substantial, and provision was made to guard against the rough usage of the probable tenants, and to minimise constant repairs.

He was not an advocate for a public authority to undertake work which could be as well or better done by private enterprise, but in a matter of that kind both could work together with advantage.

He therefore ventured to offer the following suggestions:

That the public authority should purchase sites in as close proximity to the centres of trade as possible, and let them on building leases for sixty years at a ground rent equal to that which would be given for working class dwellings in the suburbs, say 5s. per foot frontage, at the rate of nearly £6,000 per acre.

That a sum equal to 75 per cent. on the cost of the buildings be advanced to the lessee, by instalments, during building, and that, together with 3 per cent. interest per annum, to be repaid by equal quarterly payments during the whole term.

Considering the influence that these improved dwellings must exert on the habits and dispositions of the occupants, it was reasonable to assume that there would be less inmates in the workhouses, asylums, and prisons, and therefore only the rates for purely local purposes, such as cleansing, lighting, watching, etc., should be levied, and further the central staircase should be treated as a street, and cleansed, lighted, and watched by the authority.

For similar reasons to the above the inhabited house duty should also be remitted (if it was charged on this class of house). With these concessions the lessee would be enabled to let the rooms at the low rents before mentioned and yet obtain 7 per cent. interest on the remaining 25 per cent. of the cost which he would have to provide.

The local authority would be no loser, as the repayment of the principal and interest quarterly would increase the security, and the reversion to the rack rental at the end of sixty years would be a valuable asset to the ratepayers within a reasonable period. The repayment would form a fund for future loans on similar property. One of the conditions for lending the money would be that the buildings were erected in accordance with approved drawings and in a substantial manner, and another that the rents would not be increased without consent of the local authority.

As landlords the lessors would have power to insist on the property being kept in good condition, and the sanitary authority would take care that there was no overcrowding, and that the premises were kept clean and wholesome. An objection might be raised to the novel idea of interference with the almost universal system of taxation of dwelling houses, but the circumstances were special, and the very poor should not be expected to contribute towards the maintenance of paupers. It should be remembered that much of the difficulty in finding homes for this class arose from the crowding out of their dwellings by the exigencies of trade which rendered the land more valuable and the buildings erected thereon of a higher rateable value, so that after all the income arising from the rates was not less than it formerly was.

In order to put these suggestions in a practical form, the following detailed calculations were submitted.

PLAN A.

To rents derived from 12 suites of rooms at 5s. 6d. per week = per annum...				171	12	0
Less outgoings—						
Ground rent	12	10	0			
Insurance	1	5	0			
Water rate	4	0	0			
Local rates: viz., Lighting, Public Health, Sewers, General Expenses and Police (2s. in £ on net rating at £100)	10	0	0			
Annual and periodical repairs ...	30	0	0			
Loss of rent and collection 15 per cent.	24	17	0			
Repayment of principal and interest at 3 per cent. on £1,500 advanced	54	0	0			
				136	12	0
Profit				£35	0	0

Equivalent to 7 per cent. on £500.

PLAN B.

12 suites of rooms at 4s., and 12 suites at 2s. 6d. per week = per annum...				202	16	0
Less outgoings—						
Ground rent	13	10	0			
Insurance	1	10	0			
Water rate	4	4	0			
Local rates (2s. in £ on net rating at £105)	10	10	0			
Repairs, etc.	40	0	0			
Loss of rent and collection	29	10	0			
Repayment of principal and interest, £1,725 advanced	62	0	0			
				161	4	0
				£41	12	0

Equivalent to 7 per cent. on £575.

An annual investment of a little over £3 a year would produce an amount at the end of the term equivalent to the sum expended in the erection of the houses.

He thought it would be admitted that the rents proposed to be charged were much lower than the poor now paid, and that the amounts for the probable outgoings were ample, and therefore the figures were not fictitious.

So far he had only dealt with individual houses, but if, as was probable, a large scheme was propounded, provision should be made at a small rental for workshops, stores for barrows and goods, cubicles in a separate portion of the building for single men who could board with a family (a source of income often resorted to), a crêche to enable the children to be taken care of whilst the mothers were out at work, a general needlework-room for women, a reading and games-room for men, and a bar with non-intoxicants—possibly a restaurant and kitchen, where meals could be had or food cooked, and stores established on the co-operative principle.

Although the foregoing applied specially to London and other large cities, the principle could be applied to dwellings for the labouring classes in towns and villages and with better results, as the cost of the land and the heights of the buildings would be less, and the rents proportionately lower. There was also no reason why the same general plan should not be extended in size and accommodation to suit the requirements of those who could afford to pay higher rents.

Although he had treated the subject generally from an investor's point of view, public authorities, if so inclined, could themselves build and secure a profit of at the least one per cent. per annum.

It might be that the plans might not be considered perfect, but his object had been to provide only such accommodation as was absolutely necessary. If larger rooms or more advantages were desired, it was simply to increase the rentals or reduce the rate of interest on the capital invested.

He trusted that he had demonstrated the practicability of providing the very poor with healthy dwellings at low rents, without loss to the community, and that ere long the dens in which they now lived might give place to decent homes, which must tend to elevate the minds and habits of both parents and children.

Mr. W. Harpur, M.Inst.,C.E. (Cardiff), said he had not much to say in reference to the slums of Cardiff as he was thankful they had none, but he did wish to say one or two words in reference to a remark by Dr. Sykes. Dr. Sykes said that owners of slum property to some extent had an excuse in consequence of the local authority permitting conditions which were now considered insanitary. But local authorities were

t always to blame for permitting such conditions. There
s an authority above the local authority—he referred to the
cal Government Board. They had in Cardiff he was proud
say one of the healthiest towns in the country, and he
ributed that condition to some extent to an old bye-law
uiring that each house should have in connection with it an
n space proportionate to the area of the building itself.
ey recently had been obliged to make new bye-laws, and his
poration had been desirous that this old bye-law should con-
ue. The Local Government Board he was sorry to say would
t allow it, and the official of the Board, at an interview, told the
resentatives of his Council that it was not reasonable to the
dlord that this should be. He himself did not think it at
unreasonable that a landlord, whose land was worth from
to £6, or at a maximum £8 per acre, per annum, should
en it was put into the market for building purposes and
lised £60 or £80, with the security of the buildings upon
be deprived of £10 or so an acre in the aggregate rentals
order to provide proper and sufficient open space for the
ellings to be erected thereon. He thought it most unreason-
e that the Local Government Board should take such action
l become the champions of the landlords. He thought it
s more their duty to be the champions of the poor people
o were unable to look after their own interests and to see that
re was sufficient space provided in and about their houses
people to live in and breathe in a healthy manner. He was
ongly of opinion that under this new bye-law, slum districts
re more likely to arise in Cardiff in the future than under
old bye-law which had proved so good in the past. They
o asked the Board to allow them to have wider streets, but
y declined to permit them to have a street widened beyond
feet, on the same ground that it was unreasonable to require
it the landlord should provide a greater width to the street,
ugh this was subsequently slightly modified. The Local
vernment official at the same time told them that if they
uired to widen the street beyond 40 feet, they, as a local
thority, should pay for the additional land required. At the
ry time they were told this by one department of the Local
vernment Board, they were actually applying to borrow
ney to pay a landlord for selling another 10 feet of land
widen an intended new street from 40 to 50 feet, and
other department of the Local Government Board, whom
ey asked to sanction the loan, told them that they could not
nction the purchase of the land if it was a new private
reet, as they had no right to buy land to widen a private
reet, but that after the road had been made up and it was

declared a public highway, then they could sanction the borrowing. That was the absurd authority, and those were the absurd conditions which the local authorities had to work under at the present time. How could they do what they wanted to do, and were willing to do, if they had to work under such an authority and such conditions. Fortunately in the last mentioned case the landowner was a reasonable man, and he allowed the purchase of the land to stand over for a time until the street was made and declared a highway, but had he not been a reasonable man, the local authority could not have succeeded. He thought they ought to have more encouragement and assistance from the Local Government Board instead of having obstacles put in the way of doing many good things for the working classes which, except for the hindrance of Parliament and the Local Government Board, could and would be done.

Mr. Alderman PURCELL (Liverpool) remarked that he had been struck with two points in listening to the discussion that day. The first was the universal dissatisfaction with the Act of 1890, and the second the dissatisfaction which local bodies gave in their efforts to rehouse the poor. With regard to the Act of 1890 in Liverpool they were not bothered with it. He thought they were unique in having an Act which dated as far back as 1864, which enabled them to deal with the question of insanitary areas without going to Parliament or the Local Government Board, except for the purpose of borrowing money. The medical officer of health selected certain districts and stated in a letter to the town clerk that the houses were unfit for human habitation. The town clerk then forwarded the medical officer's presentment to the Grand Jury of quarter sessions. The Grand Jury consisted of gentlemen of the town and surrounding neighbourhood who understood the local question very well, and they visited the various houses. Evidence, of course, was heard by the Grand Jury, and any owner could bring or give evidence if he desired to do so. As a matter of fact, their medical officer of health was very careful, and they always found that the Grand Jury acceded to his request and then the Corporation commenced to purchase and demolish the property. They had no need to go to the Local Government Board for a provisional order. He might say that that question had been one of very great importance to Liverpool. There was no town in the country existing under the same circumstances as Liverpool, because when some years ago they awoke to the fact that there were insanitary areas they found that 15,000 or 16,000 houses were insanitary; and as on an average five people were living in each house it was a very difficult question. It had taken many years to bring it to some satisfactory conclusion. They commenced by taking houses in small lots. They perhaps took one at the entrance of a small court to allow light and air to the remainder, but they afterwards found they had to demolish the whole of the houses in the court. They had spent something like £400,000 in demolishing these insanitary areas. They did not pay too much for the insanitary houses. Under their Act they acquired those houses at from £25 to £50 per house which some people considered very cheap, but that did not altogether meet the question. Demolition did not meet the question, because the people unhoused had to be provided for, like many other communities they felt a difficulty in providing for the people they unhoused. The first experiment was to build a very large building called Victoria Square, but like other authorities they found that the people occupying their houses were not the people who were displaced. That led them to consider what could be done in the matter, and they believed they had solved the question as far as it was practicable to solve it at the present moment. They had now in Liverpool some tenements which they erected solely and entirely for the very poorest of the poor. They were not ornamental buildings; they were plain and simple structures; the walls were not even plastered; they were simply pointed and coloured. They were made comfortable but they were not made to attract men earning 35s. or £2 a week—they did not want to provide for that class of people. The people they wanted were those who subsisted principally by casual labour, and it was computed that they had 20,000 living on from 10s. to 15s. a week. Their engineer and surveyor had given attention to the matter and they had been able to build tenements for 150 families on the basis of 1s. per room per week. They let them have three rooms with scullery accommodation for 3s. 6d., 3s. 9d., and 4s. per week, and four rooms at 4s. 6d. They were continuing that work and hoped to provide for at least half the people they displaced. He regretted to say that owing to the great increase in the price of building materials and in labour, they would have to alter their basis of 1s. per room, and it would probably work out at 1s. 4d. or 1s. 6d. per room, but even that placed it within the reach of the very poorest. In order to ensure that only the class of people he had named should obtain the rooms they had appointed a sub-committee of the Housing Committee, and the present Lord Mayor, who had taken great interest in the matter, had visited every person who applied for a tenancy and from personal observation and enquiry found that they were people who had been dishoused. The result had been that they found a very great improvement in the people who obtained the houses. They (the Corporation) had no reasonable grounds for complaint. The people kept their places on the whole clean and they had a respect for them. The sanitary arrangements were always kept in order to all reasonable satisfaction, and they thought that a very great improvement had been effected in the neighbourhood. After many years consideration they had come to the conclusion that the mere fact of demolition would not solve the question at all. For it resulted generally in a family displaced going into one room. Re-building must go hand in hand with demolition, so that the people who were displaced might be rehoused. The feeling at the meeting seemed to be that they must make all the houses pay, but in Liverpool they would go on the rates if necessary. They did go on the rates for 1½d. or 2d. in the £, and if it was necessary their Council would grant them 6d. in the £. If municipalities spent money on libraries, museums, parks and gardens, baths and washhouses, and could spend large sums of money in erecting hospitals for infectious diseases, was it not fair and right that a few thousands might be spent in preventing infectious diseases? He hoped that the members of the Conference would go back to their respective councils and insist that it was necessary that the rates should be touched if they were going to deal properly with the question.

Mr. Bailie **ANDERSON** (Glasgow) said he would move "That in the opinion of this Conference the present method of dealing with insanitary areas is so extravagant and unsatisfactory, that Parliament should provide some inexpensive tribunal on the spot for deciding what areas are insanitary, and enabling local authorities to proceed at once to deal with them."

In Scotland they did not have a Local Government Board for which they were devoutly thankful. In 1897 they found they had to go to Parliament to get several areas cleared which were insanitary. They wanted power to deal with those areas and they also wanted a movable power to enable them to deal with such areas as they cropped up, but Parliament refused to give that power. They felt that it was particularly hard that they should have to go to London and take their witnesses and explain to Committees of the Houses of Parliament. It was like teaching people things they were absolutely ignorant of. It was difficult to draw the line between insanitary areas and insanitary dwellings, and in Glasgow they had to satisfy the Sheriff of the County that they had dwellings for the people to go into. In the next place in those districts which they rebuilt were very cheap dwellings for the poorest of the poor, they tried to see that the tenants were not people who should live in other districts. They had in their blocks a caretaker who was responsible for them, and who to a certain extent laid down some line that the men and women who lived in those dwellings should not have an income from all sources exceeding a certain amount, so that a well-to-do man with £2 or £3 a week could not get in.

Then there was a certain class of people in big cities who would make an area insanitary, and they had for these eight large lodging houses where men and women, for 3d. and 4d. per night, were housed under perfect conditions. Then there were a lot of men in the community who were widowers with families. Those men had to go to work early in the morning, so that in Glasgow they had built what they called a family home where the men could come and live in the same house as their children. In these houses the children were looked after, cleaned, fed, and sent to school, and the father could spend his evenings with his children in his own little home. In cheap areas they had built houses for the poorest of the working classes, but he hoped gentlemen would not go away with the idea that it was necessary to go and encroach more upon the already severely burdened ratepayers. In Glasgow they had had to tax the people for the clearing of insanitary areas, but they could make their houses earn a handsome profit if they liked. In the women's lodging house they charged 3d. per night, and provided them with cubicles and all apparatus for cooking, and even then they made a profit equal to 6 per cent. The men's lodging houses only paid 4½ per cent. He thought the important thing was first to try and get cheap land, and he hoped that more of them would take the advice of the gentleman from Leeds, and sell the land. In Glasgow they had fought successfully against the landowners with the result that the Corporation owned a great deal of land. They meant to keep as much of it as they possibly could, and he thought the day had gone past when any man would rise in the Corporation of Glasgow and propose that the land which was the heritage of the people should be sold to any builder for half its value. What he had said he trusted would give them an idea how earnest they were in trying to solve the question in Glasgow, and the one stumbling block was the cumbersome system under which they had to act. He might add that they had few arbitrations because the Corporation gave a sub-committee power to purchase between £500,000 or £600,000 worth of property. What they wanted was a simple method of dealing with this very serious problem, and they wanted to be able to deal with it on the spot, because what suited Glasgow might not suit London, and what suited London might not suit another place.

Dr. WALTER SMITH (St. Pancras, London) seconded the motion, and said that in his parish they had a very painful experience of trying to carry out the 1890 Act. They had spent nine years in trying to carry it out and were not much more forward now. They had had obstacles placed before them in every possible way, both by the Local Government Board, London County Council, and occupiers of property, and it had been no fault of the vestry that they had not proceeded. After they had thought everything was settled the question had been raised by the London County Council as to whether they had power to re-house the people outside their areas, but the question was not raised for eight or nine years, during which time the Local Government Board has ordered the authority to procure sites for re-housing outside the area.

THE CHAIRMAN said that those who were responsible for calling that Conference together thought it better to have no cut and dried resolution, and therefore it was left to the meeting to suggest any resolution it thought fit.

Mr. J. COOPER (Burgh Engineer, Edinburgh) observed that it appeared to him that the resolution was a little lame, for the mover of it, in submitting the same, had used the experience of Glasgow where they had not put the Housing Act into force. They promoted a private Bill with which they had to come to Parliament for sanction, and this naturally provoked opposition in every way. They did not use the Housing of the Working Classes Act, 1890, which provided the local tribunal which Mr. Anderson, the mover of the resolution, desired.

In Edinburgh they had used the Housing of the Working Classes Act three times over, and they had been successful each time. The medical officer selects an area which he considers insanitary and reports to the Corporation. As a rule the Corporation adopts such report and acts upon it. The resolution of the Town Council on such report is forwarded to the Secretary of State for Scotland, who regulates matters of this kind. Thereafter, the Secretary of State appoints the tribunal Mr. Anderson desires by selecting a local expert and authority, who calls all parties together and hears evidence *pro.* and *con.* After hearing such evidence this local expert reports to the Secretary of State accordingly. A provisional order is framed by the Town Clerk, which is introduced into Parliament to receive the authority of the Crown to carry out the Act.

According to the Housing of the Working Classes Act, a local gentleman of standing and experience is appointed by the Secretary of State for Scotland by request of the Town Council, to act as arbiter as to the value of the properties in question.

It seemed to him that the process was there simply ready at hand, and they the authorities of Edinburgh had found it so in their experience of it.

Councillor **Cowan** (Wood Green, Middlesex) said that unfortunately for his district, they were just outside the Metropolitan area, and were largely controlled by what might be called the least progressive County Council in England, who gave them practically no support in the removal of insanitary areas.

They had had in Wood Green an increase of population in the last ten years of something like 10,000, and in that number they had had to provide for many of the workers of London who came there to live. Unlike a previous speaker, they had been especially favoured with bye-laws allowing them to have all new streets 50 feet wide, which in his opinion was not an unmixed blessing, as it hampered the Local Council in their endeavour to purchase building land cheaply, owing to the value of land being increased considerably by reason of this permit In another direction it affected them, as builders of small property would not come into the district, and therefore houses were not built for the poor, who must necessarily live near London. It also led to the larger class of houses being used by two, three, and four families, which caused much overcrowding.

The District Council had for some time been seeking to purchase a very large insanitary area in that district, in which area a number of closing orders had been obtained against the owners, and many of the houses had been pulled down, but the difficulty of compelling landlords to sell who only held a life interest in some of the property, was almost insurmountable. Nothing short of a special Act of Parliament for compulsory purchase would accomplish the removal of that insanitary area which was a disgrace to the district, and he advocated a much more simple method of dealing with insanitary areas, by an enquiry through the Local Government Board on a compulsory order granted by that authority, as the present means of acquiring insanitary areas in the face of obstinate owners was both expensive and tedious.

Alderman **Jowett** (Bradford) hoped the resolution would not be carried, for it might have far wider results than the

Meeting was aware of. He was of opinion that if the resolution were carried out in many provincial towns and cities where property owners were strong on the Councils, they would be in a far worse position than at present.

Mr. JOHNSON said he did not think any delegate had been nominated with power to vote on such a resolution, and he would like to know if they were passing a personal opinion or were supposed to represent the opinion of their Councils. He thought they had no right to pass the resolution.

Mr. M. CLOSE (St. Pancras) moved as an amendment, "That this conference is of opinion that the present method of dealing with insanitary areas is extravagant and unsatisfactory, and urges Parliament to provide some less expensive and more expeditious mode of procedure."

Mr. Councillor HOLDER (Hull) seconded the amendment.

Dr. J. CARSWELL (Glasgow) asked Baillie Anderson not to accept the amendment because it left out entirely the whole point of the discussion, viz., the necessity for a local enquiry taking the place of proceeding by provisional order.

Mr. JAMES PRINCE (Flintshire) said he had travelled from Wales, a distance of about 200 miles, to attend the Conference, and after hearing the discussions he considered they had only touched the fringe of the question, and was of opinion that the problem of the housing of the poor could not be solved without taking into account the taxation of land values, and would like to move an amendment to this effect:—"That this Conference was of opinion that the problem of Housing the Working Classes cannot be satisfactorily dealt with until a Bill be passed in Parliament enabling local authorities to levy a tax on land values."

THE CHAIRMAN said he believed he had heard of the amendment before, he could not accept it now.

The amendment proposed by Mr. Close was then carried, and agreed to as the substantive resolution.

A vote of thanks to Mr. Beachcroft for occupying the chair concluded the proceedings of the first day of the Conference.

I.—IMPROVED HOUSES FOR TOWN DWELLERS.
II.—IMPROVED MEANS OF COMMUNICATION.

INTRODUCTORY REMARKS BY THE CHAIRMAN,

SIR SYDNEY H. WATERLOW, BART.

July 31st, 1900.

It affords me great pleasure to be here to-day, and to take part in the discussion of the subjects submitted by the Sanitary Institute, viz.:—

(1) Improvement of the houses of Town Dwellers.
(2) Improved means of communication.

These two points are the main factors in the consideration of the best method of solving what is generally considered the most important question of the day, namely, the better Housing of the Working Classes.

Society is deeply indebted to the pioneers in this work, the late Prince Consort, Lady Burdett Coutts, the Society for Improving the condition of the Working Classes, the Metropolitan Association, and several others. The late Earl of Shaftesbury, speaking in 1863, said, "The condition of the dwellings of the labouring classes is the besetting sin and difficulty of the time, for it stands in the way of every good moral impression." I have never forgotten his words.

The question is not a new one to me. Nearly forty years ago I took the matter in hand, feeling then as strongly as I feel now, that the best way to help the "weekly wage class," for I prefer those words to the words "working class," to a happier and better life was to give them better family dwellings, together with homes in which the domestic virtues might be properly cultivated and developed—homes which would be sufficiently attractive to keep them away from the brilliant attractions of the palatial public houses.

In 1862 I called a few friends together, amongst whom were Russell Gurney, the then Recorder of London, Samuel Morley, W. J. Thomson, Mr. J. Kemp Welch, Mr. George Moore, of Bow Church Yard, Alderman Finnis and Mr. Charles Morrison. With the help of these and other friends a private company was formed, of which I have been the Chairman for thirty-seven years. We have spent a million and quarter of money in the erection of 5,600 tenements occupied by nearly 30,000 persons. I refer to these facts in order to show what might be done by a few private individuals to help a movement which can only be adequately dealt with by local authorities responsible for the sanitary arrangements of every city. I quite agree with Lord Salisbury when speaking on this subject the other day, he said: "You cannot hope, do what you will, you cannot hope to meet this great evil without the assistance of private individuals, it is absurd to suppose that the governing body of a great city like London will be able, without extravagant and un-called for expenditure, to undertake the remedy, you must trust to private capital, but if we trust to private capital we must give that capital some kind of confidence. Investors must believe that the investments which they are going to make with their money will not be fraught with danger to themselves." But Lord Salisbury leaves the subject without any answer to the difficult question of how it is that the private individual can make the dwellings, for the weekly wage class, self-supporting, while the local authorities, raising money at two and a half per cent., cannot accomplish the same result.

In 1862 I first built four blocks of dwellings on my own account, each containing seventy rooms. I was able to build them at £42 per room, but at the present time the London County Council are unable to build at less than double that amount, and my company are this year completing fifty-eight new dwellings in the Old Kent Road at a cost of £75 per room. I am quite willing to admit that the experience of forty years has taught us to make many improvements, both in the size and in the surroundings of the new tenements, but certainly not sufficient to justify the great increase in the cost. This increase has been gradual. In 1870 the cost was about £45 per room, in 1875–85, £55 per room, in 1885–1900, £70 to £75 per room. This increase is no doubt mainly owing to the fact that more money has to be paid to the workmen for shorter hours and less work. There is a prevailing idea that the work-people employed by the County Council do not give as fair a day's work for a fair day's pay as when they are working for a private contractor. No doubt the contractor exercises a much more constant supervision over the details of his labour, and of the work generally, and this probably secures a better return for the wages paid.

Passing for a moment from the question of cost, let me call your attention to the enormous increase in the out-goings, especially in the local taxation. In Waleran Buildings in the Old Kent Road, where I have to charge 3s. per room, the out-goings will amount to 56·3 per cent., or more than half the rent. In Bethnal Green Parish, in 1884, my company paid local rates amounting to £2,197; in 1899, fifteen years later, they had to pay £2,587 for rates on the same premises, an increase of 18 per cent. The increase in some of the West End Parishes is relatively much larger. In 1871 we paid £117 local rates on a block of buildings, and in 1899, twenty-eight years later, we paid £289 on the same block, or an increase of 150 per cent., and on one Estate the rates have increased 160 per cent. in twenty-four years. These totals furnish the following results:—That if the local rates had remained the same as they were when our buildings were first erected, my company would be paying £3,957 per annum less than we are now paying. In the last *four* years only, local rates have increased £1,023 per annum on the same buildings, there can be no doubt that this very heavy increase at every quinquennial assessment deters capitalists from promoting new building companies. I do not suggest that workmen's dwellings should be assessed differently from other dwellings, but we must always bear in mind that an increase in rates must necessarily lead to an increase of rent. If the rates were collected direct from each occupier, he would have an interest in watching the local expenditure and keeping down any extravagance.

At the present time the average rent charged by my Company in all the buildings in occupation is 2s. 3d. per room per week, but in the new buildings which have cost so much more we shall have to charge 3s. per room per week, and the rooms have all been readily taken up at this price, for they are better in situation and in many other respects than some of those previously erected. The question of situation is almost as important to a weekly wage man as it is to a man of business; if he lives near his work he can afford to pay more rent, as he saves time in going and returning, and as he is paid by the hour, "time is money" to him, and if near a busy public thoroughfare his wife and the junior members of the family can generally get some employment connected with the shops and business premises. This materially helps the family income.

This brings me to say a word upon the Act passed this Session, enabling the London County Council to erect working class dwellings "outside their district." It is said that the County Council propose to provide this class of dwelling at Tooting, or even at a longer distance from the centre of London. I am afraid such a scheme will not accomplish the result that some of their members seem to anticipate. The cost of the dwellings will be as great, if not greater, than in London, and the time spent by the bread-winner on the railway or in the tram-cars will be a serious loss. In the absence of local markets the cost of living will be higher than in London, and in my opinion, it is not good policy to separate the weekly wage class from the more wealthy parts of the community. The rich should live amongst the poor that they may sympathise and help them in their troubles, and that the poor may feel that the rich are their friends and not their enemies.

If the advice of Lord Salisbury is to be followed and we are to hope to have in the future the same help from private Capitalists that we have had in the past, the Government should be more liberal with reference to the charge they make for money advanced on mortgage by the Public Works Loan Commissioners. Thirty years ago they advanced the money at four per cent., redeemable in forty years, this necessitated an annual payment of £5 1s. per cent. per annum. By a recent Act of Parliament the rate was reduced to £3 2s. 6d., redeemable in thirty years, but this requires the payment of £5 4s. per cent. per annum. If they would advance the money at this rate and extend the term of repayment to eighty years it would be a great inducement to private capitalists to invest in workmen's dwellings. I think I am right in saying that the Government have never lost a single penny of the money advanced towards the construction of workmen's dwellings, but on the contrary have made a large profit.

It has been said that the dwellings erected by private capitalists and by the County Council do not provide for the lowest and the poorest class. The theory that I have always acted upon is, that the wisest plan in dealing with this difficult question is to attempt, in the first place, to meet the wants of that portion of the working class who are earning from 25s. to £2 per week. As the pressure of this class in finding decent homes is lightened, and better accommodation provided for their use, the class immediately beneath them will shift into the quarters from which they gradually migrate, and this will be repeated until at last the lowest of all comprising what may be emphatically called the "lower orders" and who are least likely to appreciate the comforts of decent homes will, slowly but surely receive their share of the benefits enjoyed proportionately by those above them.

If twenty Industrial Dwellings' Companies had been formed instead of one, our problem would have been solved to a much greater extent, but I well know the difficulty of forming and working such companies; the collection of capital and the daily supervision required to ensure economical expenditure is really the work of a life time.

I have always felt that the greatest benefit that has been derived from the erection of the "improved dwellings" for the working classes is the great reduction in the death-rate. The dwellings belonging to my Company are spread all over

London; in 1899 our average death-rate, as determined by the Registrar of Births and Deaths, was 11·5 in the 1,000, including forty-five deaths in hospitals, as compared with 19·8, the average death-rate in the County of London. It must always be borne in mind that a low death-rate means a low disease-rate.

Another great advantage arises from the fact that by means of these new buildings a much larger population is accommodated, and under much better sanitary arrangements, than were previously accommodated in the old buildings.

The Company's estates provide 746 persons to the acre, while the number in the County of London averages only 60·9 per acre.

The best evidence of the necessity for more improved dwellings is to be seen in the fact that, with 5,600 tenements to let, we have, at the present moment, less than one per cent. empty. Another very interesting point is that the tenants pay their rent with such admirable regularity. On a collection of £115,361 for the year 1899, the loss of rent accruing due amounted to only 2s. 11d. per cent., and this chiefly on the score of poverty and inability to pay.

I have now only to thank you for the kind attention you have given to the facts which I have endeavoured to bring before you. Some of you may perhaps think they are rather too personal, but it must be borne in mind that what one company can do may be done by another company. When I first took up this work my greatest hope was that if I could make it a success, many other companies would be formed, and in this way Lord Salisbury's suggestion that we "must trust to private capital" would be, in every way, realised.

Mr. L. WHITEMORE (Hackney) stated that although he did not come with the intention of speaking he found it almost forced upon him. It seemed to him that unless they had some resolution before the meeting the proceedings would result only in an academic discussion. What he wanted was for the Conference to have some effect in bringing forward the reforms they needed. Great emphasis had been laid on the fact that people were not fit and respectable enough to go into some of the houses, but what made them so? He knew something about that. In his neighbourhood where houses were at first let at 6s. or 7s. a week, by-and-by that house was sold and the rent went up to 9s. or 10s. a week. The consequence was that where formerly they had one family living respectably, two families got in, although the sanitary and general arrangements were only for one family. How could families then live respectably?

If they took the highest, noblest, and most cultured people in the land and placed them under those conditions they would sink to the same state. That was a point they wanted to deal with. Something had been said also about rates ruling the rents, and he knew something about the rates. Their quinquennial period was only just over, and within a fortnight of it being over he knew numbers of landlords just coming within the Compounding Act who raised their rent just over it; so for the five years reaping the benefit of both the increased rent and the compounding reduction, and acting dishonestly both to the parish and the tenant. That wanted a remedy. Two years ago a deputation came before the Public Health Committee of which he was a member, and in answer to a complaint which he made as to the raising of the rent, one of the deputation said—"Yes, if you order work to be done and I spend £10 on that work I count the money so spent as capital expenditure." That was to say that the landlord wanted all the privileges and none of the responsibility. It did not matter to the landlord what the conditions of his houses were so long as he got his rent, but the moment they said that the houses should be put in a sanitary condition then the rent went up. He knew cases where people were afraid to make any complaint as to the state of their houses, because they knew that as soon as anything had to be done the rents would be raised. The direct result of all this rent raising was overcrowding, for the tenant unable to pay the increased rent was obliged to sub-let, and in a short time houses of five, six, and seven rooms with only one w.c. had two, three, and even four families living in them, with the inevitable consequence—greatly increased death-rate. Therefore, believing that it was absolutely necessary in the interests of public health to prevent overcrowding in existing houses, as well as to build new ones on the principle "that while the grass is growing the horse is starving," and with a view of testing the feelings of the Conference, he moved—(*a*) "To prevent overcrowding, it is necessary for local authorities to build workmen's dwellings, and to enable them to be let at a fair rental, it is absolutely necessary that they be able to borrow money for at least 100 years for buildings as well as land"; (*b*) "That it is necessary to check overcrowding in existing houses, for which purpose there should be some special authority to fix the rent of all property at less than £40 a year rental value if let to more than one family"; (*c*) "That where any work is done by order of the sanitary authority it shall be a penal offence to raise the rent within six months of the work being done"; (*d*) "No landlord shall raise his rent within the quinquennial period without giving notice to the local authority"; (*e*) "And the local authority shall have power to prevent two or more families occupying houses where the sanitary arrangements are only sufficient for one." Commenting on the resolutions, the speaker said he was referring to London because the houses were so sub-let. Perhaps the man who paid the rates only occupied two rooms—in fact he knew scores of cases of that kind. He thought the man who invested his money in house property had as much right to his rent as the man who invested his money in stocks, but still the man with the house property got more out of it, and he should also recollect that those who paid rent had as much right to a house fit to live in for the money so spent as he had to the interest on his money invested in the house.

Mr. T. **Adams** (Plumstead), in seconding the resolution, said he had to take into consideration something which the Chairman had been good enough to tell them, viz., that rents must necessarily be governed by rates. Like that of the last speaker, his experience had been that since the quinquennial assessment rents had been raised. He knew cases where the rents were a great deal higher than they used to be, although the rates were lower.

Dr. R. **Sydney Marsden** moved "That that question be not now put."

A Delegate seconded the motion, which was carried.

Mr. **Adams** continuing said, he supposed he could speak to the Chairman's address, and could speak of the kindly sympathy of the capitalists who were prepared to build houses for workmen's dwellings for 5 per cent. interest. It appeared to him that they ought to cater for the poorest classes, both from a moral, physical, social, intellectual, and economical, as well as a commercial standpoint. Because it did not pay to breed weaklings, neither was it economical to propagate criminals. He had hoped that that large meeting would have encouraged not so much private enterprise as municipal enterprise. He hoped that that would still be the keynote for the platform, notwithstanding what they had seen the previous day. The serious matter should be how they could construct dwellings for workmen at the least possible rent. Yesterday they found 10s. being paid by a man having four children to maintain out of a wage of 25s. a week, and that 10s. per week was for three very small rooms. Some years ago he heard a gentleman from the Bench say that he considered it most extravagant that a workman should be called upon to pay one sixth of his wages for his habitation. The previous day they saw instances of more than one third of a man's wages go for his dwelling. He thought that was worth their consideration. How much could they do, and what could they do from a practical standpoint? Apart from seeing how much dividend they could get, it was a question which must be considered from a moral standpoint for if they improved the environment of people, many who were now in a low state would become honest, respectable and useful citizens. Although the resolution had been ruled out of order he trusted that something practical would come from the Conference.

Mr. Alderman THOMPSON (Richmond) said he thought the object of the meeting was that they as practical men and women should try to arrive at some kind of idea as to what improvement they could get in the homes of town dwellers, and in improved means of communication. Taking the last point first—improved means of communication—that at once seemed to indicate that in the opinion of those who promoted the Conference, they must look for a very large measure of housing accommodation to be provided in the outskirts of the large towns, and at some distance from the centre. He would not labour that point, but he thought on sanitary grounds it was not good that families should be piled up one on the top of another in those great buildings, while from an economic standpoint it was a mistake, for the cost per room of building block dwellings was more than double the cost of building cottages in the outskirts. It was not egotism to speak of practical experience, for it was really the only thing of value they had, and he would say that he had watched the cost of building in London and found that some of the large block dwellings cost as much as £135 per room in the case of the London County Council, compared with which the cost of the cottage dwellings in Richmond came out at only £43 per room. If the cost was three times as great in the case of municipal enterprise, which was subject no doubt to drawbacks that private enterprise was not, it went to show that it was inadvisable to encourage the practice of building huge blocks for a large number of persons and herding them together. He had seen enough in Glasgow to sicken him of the plan of accumulating people in large centres. Many people said that the obvious remedy was to get the people out to the outskirts, and everybody had a plan that was going to settle the question. Some had plans of municipal enterprise, some had plans for cheap trams, cheap railway fares, workmen's trains and so on. There was room for all these agencies. What he hoped they would all agree upon, was not to rule out any form of enterprise, municipal or private, which would aim at the end they had in view, namely, that of remedying the house famine by providing and making accessible more and cheaper houses for the working classes to dwell in. He thought he had pointed out that they could get cheaper houses by building cottages, but he would not labour that point. If they broke down the "corner" which now existed with regard to land, all round London many cheaper houses would be built. Many people thought that if they bought land round London they would force up the value, but he would put this point before them—why was it that land was at such a high value in the outskirts of London—was it not because of the "corner" that existed. If local authorities could compel some owners to sell a quantity of land at a fair price, and thus enable it to be put on the market for cottage property, all the others would come in at once, and he believed there would be a reduction in the cost of land due to the break up of the land "corner." When the Government Housing Bill was passed, local authorities would be able to buy land in large quantities on the outskirts of the towns and throw it upon the market for building purposes. If the local authorites in and near London could secure 10,000 acres, and throw it upon the market for building purposes, it would not cost more than £500 per acre, and on it they could house a million people, while the houses could be put up much cheaper than they could be erected in the centre of town. Let them first have cheap land and cheap buildings, and then when those cheap buildings were up, deal with the question as to whether they should provide means of communication. Experience had shown that mere communication between the centre and a field was no good whatever to the workers in London, and it was a positive punishment to the working classes who already resided in the suburban districts. He found that almost every local authority around London was face to face with the question of a house famine, owing to improved travelling facilities; they found it at Tottenham and Enfield and other places. The question next arose as to whether private enterprise would step in to meet the demand. He was afraid that private enterprise unstimulated, uneducated and unassisted would not do so. There must be some form of co-operation between the various agencies which were trying to solve the question, and he thought the first step must be that land should be in the hands of local authorities, and that they should be empowered to lease the land to such private capitalists, companies, and individuals, as were willing to put up *sanitary houses*, because if there was one thing to be dreaded more than the present state of affairs, it was the unrestricted action of private enterprise in the matter. They knew what had been done in the past, and what was being done now in spite of building bye laws. Acres and acres of new slums were being created far worse than the old slums. They could not unless they were the owners of the land secure sufficiently stringent clauses to get sanitary houses. Let them get the land in their hands and then insist on sanitary cottages being put up. If private enterprise could put up sanitary cottages, and do it cheaper than the municipal authority, let them do it by all means—in fact, let the local authorities encourage private enterprise. If there were companies, like that of the Chairman's, or co-operative societies, or individuals under Mr. Chamberlain's Act, who would lease land from the local authorities, and put up healthy houses, then he thought they could trust to the ordinary working of economic laws to bring about a large increase in housing accommodation of a suitable character, and at a lower rent. He would not trouble them with many particulars of the Richmond cottages, because he understood a large number of those present would avail themselves of the invitation to visit them. He started the operation in 1890, just after the act was passed, and got schemes carried in 1892. It was not a political question, although he did not mean to say that some of the baser men of both political parties did not think more of their pockets and of their small property than the interest of the people. They had men of that kind in both political parties, he regretted to say, but on the other hand the thoughtful, earnest men of both political parties were willing, and had been willing, to go side by side in the direction of making experiments to try and solve the problem.

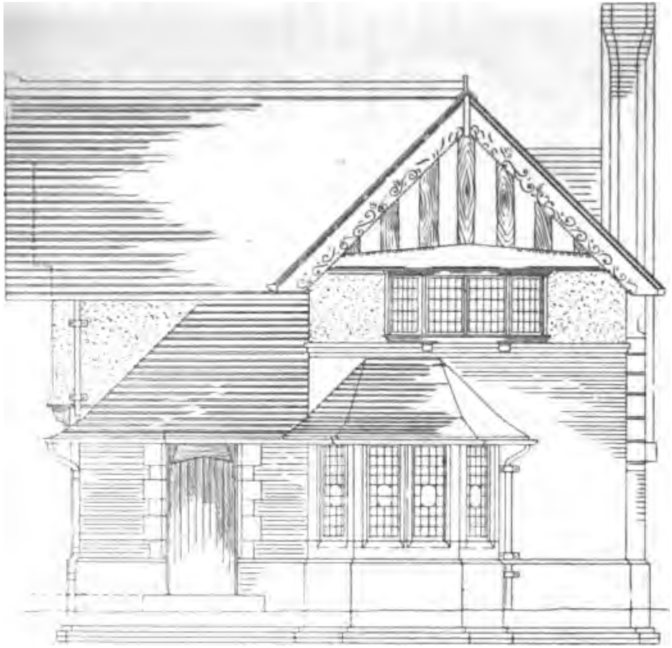
As they must, either by private or municipal enterprise, build to a large extent suburban colonies, in order to relieve the present "house famine," the leading features of the Richmond scheme might be of some interest to them, more especially as they had only just completed their second lot of cottages which had been erected on land costing £1,000 an acre, and with building at the present price of materials and paying the London rate of wages to the workmen, the figures would be up-to-date and reliable. Arrangements had been made to supply those who visited Richmond with statements as to the number, cost, and rents of the various types of cottage dwellings, but he would point out that for 7s. 9d. per week they let good six-roomed cottages at a profit, with corresponding rents for a smaller number of rooms. The first difficulty they experienced was the growing cost of materials and labour, but by building on a square plan, avoiding back additions as much as possible, and keeping clear of fads which cost more than they were worth, they had provided good simple healthy cottages at an inclusive cost of from £42 to £52 per room. The other difficulty, of course, which faced them was the question of their relations with the Local Government Board. In that direction he suggested that they could get many reforms. A more insulting circular than that recently sent out by the Board he had never seen. They told local authorities to try and do their duty in the housing question, while at the same time they harassed them in every way. They had kept his Council hanging about for several years which added greatly to the cost of the buildings. When it came to building he would be the last person in the world to advocate the erection of an insanitary house, but he would have thought that a wise Local Government Board would have at least allowed them to make as many bedrooms in a cottage as possible, consistent with health and safety; but the Boards and bye-laws said that if they put a third bedroom in the attic floor there must be a 14 in. wall to carry it, although every practical man knew that it was unnecessary. If allowed to provide this additional bedroom in the way suggested the rents of these Class B houses would have been 1s. 3d. per room per week instead of 1s. 6d. as at present. Again, they did not feel it was right that the working men in their cottages should have in the next forty years to buy 132 houses for the well-to-do people of Richmond, and he considered it would be only reasonable that the repayment of the cost of buildings should be extended over sixty years, which was the statutory period permissible under the existing law. On the average, the rents of municipal dwellings throughout the country were 1s. per week higher than they need be, because the Local Government Board had in the great majority of cases unnecessarily restricted the term of repayment to from thirty to forty years in the case of the buildings and fifty years in the case of the land. In spite of many verbal expressions of sympathy, they found the majority of the House of Commons voting against a clause enabling the period for repayment to be extended, so that Members of Parliament wanted more education on this point. That was one way in which they were hampered. If they could get the money from the Government at 2½ per cent., and have the period of repayment for building extended to sixty years and to 100 years for the land, they could let their houses at what he considered should be the standard rate for workmen's houses outside London, and that was 1s. a room per week. They could certainly let their present Richmond cottages at 1s. per room per week if the Government would lend money at 2½ per cent., and give sixty and 100 years for the repayment. Why they did not do so was because public authorities were not yet aroused, and had not agreed upon a common line of action, and he hoped that one result of that Conference would be to thoroughly show politicians that they, like the Association of Municipal Corporations, had agreed to insist on having 100 years for repayment for the land and sixty years for the buildings; he also thought the Legislature might reasonably give them money at the market rate of interest through the Public Works Loan Commissioners, for that body lent money at low rates for other purposes not half so important. There was another simple point which also could be carried by a little pressure—the relaxation of such rules of the Local Government Board as were only persisted in because of the red tape system —rules which had always been and therefore always must be. If they could not break down that red tape, local authorities could do nothing. He hoped in time they could get sound public opinion to bear, and that local authorities would obtain possession of plenty of land and would lease it, so that at the end of seventy-five years they would have a valuable property in their hands, and then he did not see why they should not have proper regulations and insist on everybody living in a sanitary house.

Mr. ADAMS asked Mr. Thompson whether he would not think it more advisable if they asked the Local Government Board that the land should become an asset.

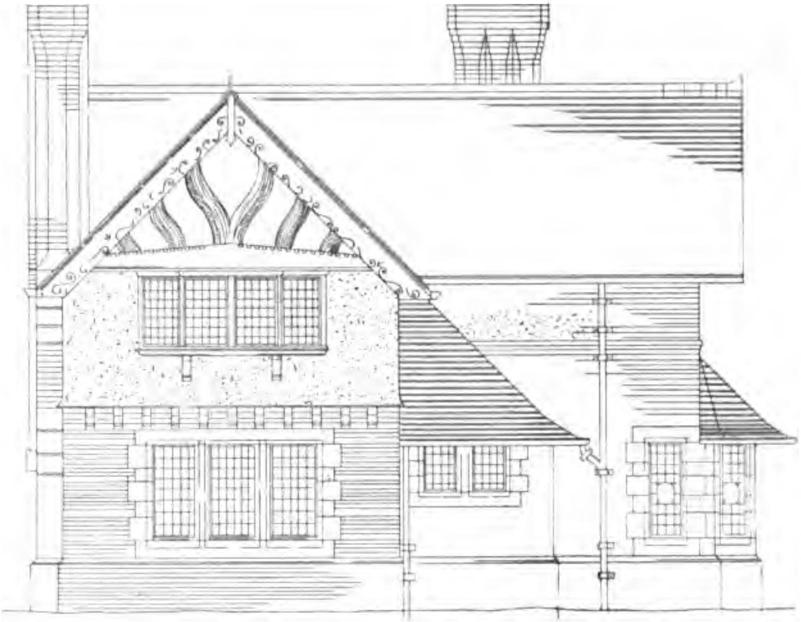
Mr. THOMPSON said there was a general opinion amongst Conservative and Liberal Members of Parliament, and many outside bodies interested in housing, in favour of extending the period for loans, whereas a number of doctrinaries did not like the idea of taking land as an asset. While he would not object himself to Mr. Adams' suggestion, what they had to do was to urge the practical points likely to receive most general support.

Mr. W. E. RILEY (superintending Architect to the London Country Council) observed that he was associated with the Chairman's enterprises twenty-one years ago, and had the honour of designing some of the earlier blocks of the Waterlow Dwellings Company. He had recently been selected by his Committee to represent them at the Housing Congress at the Paris Exhibition, and during the four days they were there, he heard many eloquent addresses on *why* the poor should be "housed." He now never asked himself that question, but simply "*How* shall I house," although that might in some measure be due to his public position and his having to carry out the decisions of those who represented the ratepayers of London. They found the policy, and he trusted that he would

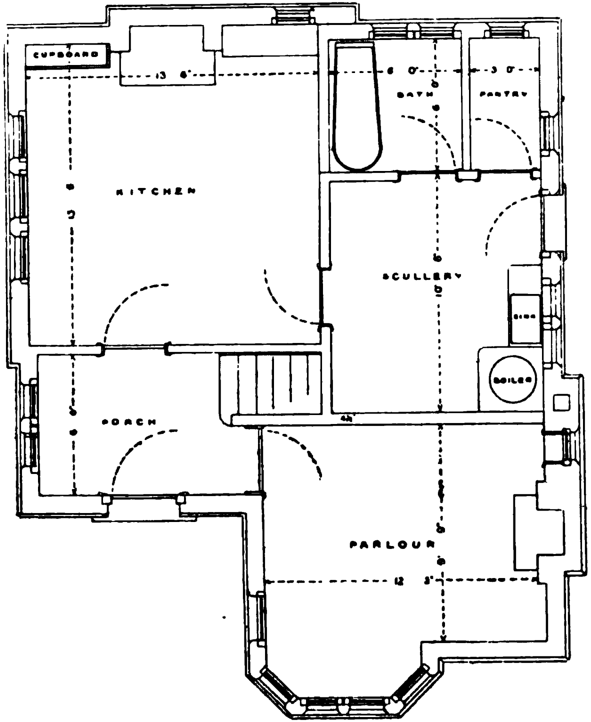
Cottage erected by Messrs. LEVER BROS., LIMITED, at Port Sunlight, Cheshire,
and exhibited at the PARIS EXHIBITION.



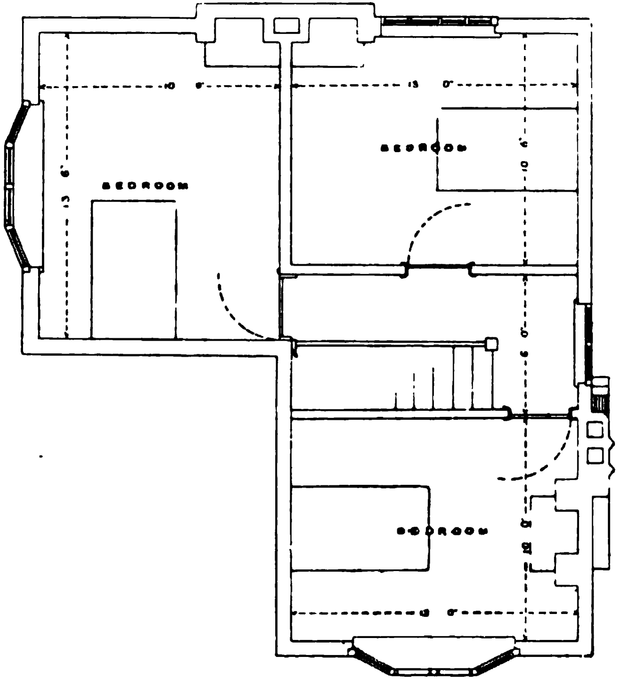
FRONT ELEVATION.



SIDE ELEVATION.



GROUND FLOOR PLAN.



FIRST FLOOR PLAN.

WILLIAM & SEGAR OWEN, *Architects*,
Warrington.

find the means to carry it out. During the Paris Exhibition Congress a good deal of discussion had arisen as to what return on capital should be expected from the dwellings of the poor, and as a rule he gathered that the Frenchman expected 5 per cent. Mr. Riley proceeded to exhibit some plans of dwellings erected in foreign countries and pointed out that in Belgium they were apparently fifty years behind the times as regarded sanitation. One cottage had a cesspool and water tank side by side, and a direct overflow to drain from the latter. There was a model of an excellent cottage at the Paris Exhibition shown by Lever Bros. Ltd., of Port Sunlight, and he conceived that to be the best building of its kind which was exhibited. The ground plan and elevation are given in the plate facing page 428. It had a commodious plan, an attractive elevation, and cost little money, but he had an impression it was subsidised a little by the Company to make the rent accessible to the workmen.* He thought that something was written off annually to cover the loss on cottages, but he might be wrong. With regard to the planning of the German exhibits they were practical, designed with Teutonic precision and very much on the barrack system.

Proceeding to deal with the London County Council dwellings' plans exhibited by the Sanitary Institute, Mr. Riley said there was a plan of a cottage shown which was lately built in Brook Street, Limehouse, which he considered a cheap and good type. He was rather struck with the impression which seemed to prevail, that a room in a cottage necessarily should be cheaper than a room in block dwellings, but the London County Council had built block dwellings in London, in crowded districts, at less than £77 per room. It was a very cheap kind of tenement with balcony access, which enabled them to get more habitable rooms both on the front and back of the blocks with fewer internal passages. The land, of course, was the crux of all schemes in London, and the best utilization of the land, by placing habitable rooms on both frontages, appeared to be the acme of planning. It would probably be attained most readily by introducing the balcony dwelling and massing the sculleries and unproductive conveniences, where they would not take up any frontages. Those Brook Street cottages cost £87 10s. 2d. per room. A good internal finish was very important to bear in mind. Cheapness of building, at the prices now ruling, was essential, and they would find themselves constantly confronted with difficulties of finance, but he would recommend all of them who went into the "housing" question to first give the best sanitary arrangement, and a clean and wholesome internal finish. The rents obtainable would not permit of dwellings being too expensive, and they must do the best they could on the elevation with any surplus that remained. It seemed to him that there was more overcrowding per acre at the present moment in the better class flats in London than could possibly take place in working class dwellings. They could put more people to the acre counting two persons to a room in a middle-class flat than they could under the law, in working class dwellings. He thought it was one of the important factors in the equation to have some clear *data* which they could observe in designing workmen's dwellings without being so much hampered in regard to what they should not do by the Government departments, in schemes of Parts I. and II. of the Housing of the Working Classes Act. A standard should be fixed which was not capricious. The question of minimum income which would not entail loss had also been a very vexed one, and it might interest them to know that in all the dwellings of the London County Council where they had built themselves, they had an average return of 3½ per cent. There were some dwellings which returned as small an income as 2½ per cent., but the whole of the Bethnal Green Estate, which was designed by his predecessor, showed a return of 3·66 per cent., and they would all agree that that was a very able monument to Mr. Blashill's labours on working class dwellings in London. He would be most happy, at all times, to forward any information he had to any of his provincial friends, but he hoped they would not forget that there was an obligation upon them to do something in return if he needed it.

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* The cottage is an exact reproduction of one of the cottages erected by Lever Bros. at Port Sunlight, where a large number are erected, each one of which has a bath fixed in it; each has also a separate W.C. and dust receptacle, and a yard of about 200 feet in extent. Most of the cottages have garden allotments and gardens in front of the houses. The cottages vary considerably in cost, and a single one is more costly than those which have been erected in groups, numbering from three to ten in each group. The average cost is about £300 each. The cottages are all faced with pressed Welsh brick, and the roofs are tiled.

A Delegate asked if Mr. Riley could tell what proportion of the cost of building was due to the building itself.

Mr. Riley replied that in central districts the land had to be written down to what is called "Housing Value" before it was built upon. The value of the land in the block dwellings at Millbank was about £15 10s. per room, but Millbank was not written down. It was purchased from H. M. Government at a special price with the obligation to use it for "Housing" purposes, and it was hardly a fair comparison in regard to cost with sites in the central portions of London.

The Delegate asked what was the price in the case of Reid's brewery.

Mr. **Riley** said he had not got the figures with him, but he thought they might take it that the land was written down in that case.

Mr. **Edward Bond**, M.P. (London), said he might mention that he was the Chairman of the East-End Dwellings Company, which for the last fourteen or fifteen years had been building in London, and which set itself in the first instance to build rather for the classes which had been left out more or less by Companies already in the field. They set themselves to consider how far they could provide dwellings for that class of the population who did not earn upon an average more than from 10s. to a guinea a week, and they had attempted to do that. He did not say that all the dwellings they had put up had been of that kind, but still they had a certain number of buildings which were specially designed to meet the wants of that particular class. He thought what they all must remember when they tried to build dwellings for the working classes was this—that it was no use putting up buildings unless they were going to pay. If they were going into the thing as a commercial enterprise they must earn some return on their capital, or their enterprise became unfruitful. They might put up one block and be extravagant in putting it up and let it below the commercial value, but if they did that their enterprise ended there, because other people would not come in and subscribe money simply to get 2 or 2½ per cent. The municipalities were not hampered to that extent, but they did seem to him to be hampered in many other ways which made it extremely difficult for them to deal with that question adequately. There was a great tendency at the present moment to make experiments in the direction of the housing of the working classes. There was a beginning to that tendency ten or twelve years ago, and in several cases with more or less success municipalities had made a venture in that direction. They did it at Nottingham and at Glasgow, and he believed in other towns. Certainly at Nottingham the experiment was far from being a success, and it was exceedingly doubtful whether those experiments were likely to be a thorough success to the municipalities undertaking them if they looked at the question of rent. The London County Council had gone into the thing very heartily and strongly for some few years past. He was a member of the London County Council, and he had an opportunity of watching the experiments which had been made. They had put up some blocks which were satisfactory in design and satisfactory in appearance, but they had not succeeded in those blocks in doing anything at all for that section of the people of whom he had spoken, and they had not succeeded in earning what he would call a fair return on the capital invested. Mr. Riley told them that the return upon the dwellings of the London County Council averaged at something between 3 and 4 per cent.; this was not sufficient to meet the interest on the capital employed and provide for that sinking fund which, under existing regulations, was required to replace the capital which was borrowed. That meant, as a matter of fact, that those buildings to a certain extent were a charge upon the ratepayers of the present generation; and what the London County Council had done with all its efforts and enterprise was to provide some very nice dwellings for a class of people who could just as well have been housed by the Dwellings Companies if the Dwellings Companies had been allowed to take up the land which was cleared under the Artizans' and Labourers' Dwellings Acts. It was not the original intention of Parliament when those Acts were passed that the municipality who did the clearing work should itself build on the site, but on the contrary they made provision that not until it was proved by offering the land for sale or for lease that the work could not be done by other bodies, was the local authority to do the work itself. It was only quite recently that Parliament had seemed desirous of encouraging local authorities themselves to build. He himself saw certain dangers connected with that, but he need not go into that question now. If they were going to try the experiment they should not lay themselves out to produce what were called model cottages in the sense that they would be attractive to the eye and delightful to show to the ignoramus who would say, "See what beautiful cottages we build for the working classes." The ignoramus did not inquire as to the occupations or the wages of those people who inhabited the cottages, and they thought that a great work was being done because some cottages were erected which were let at 8s. or 10s. a week. By doing that they really were doing nothing whatever towards solving the difficult problem of housing the poor. The problem was an economic problem. There was no housing question by itself; it was really a question of wages and rent. It was a problem of the same class as the boot question, or the food question, or the clothing question. They had to consider what was the best accommodation they could give (at a reasonable return for the outlay) to the man or woman who was earning a very poor wage indeed. They could only give a person earning a very poor wage a poor house.

It was impossible by any *hocus pocus*, or by any manipulation of public money, to give people who were essentially poor a house which was above their means. They had to consider, and they must consider, that they were dealing with the public purse. They could not therefore venture to put up houses which would not yield a return for the money which represented the interest on that sum they had to borrow and provide for the necessary sinking fund. But if they did that he found that in London they were met with all kinds of difficulties—difficulties much greater to-day than there were thirteen or fourteen years ago. One of the difficulties now was the enormous rise in the rate of wages in the building trade, and in the price of all materials used for building. He found that a room which he could build at the beginning of his Company's operations for from £50 to £60 would cost something between £75 and £90 now. The land, in his experience, was not a great question. The ground rent of such a room as he would offer was something like 3d. or 4d. a week, and although that was an appreciable sum to a working man, it was not a figure which made all the difference as to grappling successfully or otherwise with the matter in hand. First they had the rise in wages and the rise in building materials, and they had also got restrictions, some of which were quite proper, but some were needlessly stringent. They had also the serious difficulty which arose from the increase of the rates. The London County Council, like other municipal bodies, had embarked on a great many enterprises, some of them exceedingly beneficial to the Metropolis and some of more doubtful value, but whether beneficial or otherwise after all they had to be paid for, and had to be paid for out of the rates; for the fact that the rates and the rent were paid together meant that the apparent rent of a room went up very high, and made it more difficult to build in such a way as to meet the wants of the very poorest classes. The question however had to be faced, and he thought it was best faced by private enterprise; but whether by private enterprise or by public endeavours, what they had to do if they were to build for the poorest class was to make up their minds that they could not give them all the conveniences of a model cottage. They must make up their minds to allow people to live in single room tenements, but of course they would take care that the tenements were not over-crowded beyond the limits which the sanitary law prescribed. They must be content to dispense with external ornament. They could not hope to give, in London at all events, to the very poorest class more than one or two plain rooms—one perhaps 12 ft. square and 8 ft. to 9 ft. in height, and the other of rather less floor space, with the use in common either of a large washing place or a space upon the staircase where the rooms were situated which were used, in common by the tenants of one, two, three, or four of the tenements in the building. They could not get a self-contained tenement and charge a rent which none of the people they tried to help could afford to pay. He heard Mr. Thompson talk of the cottages at Richmond. He had not seen them and would make no observations upon them, but he would like to know what the rents were.

Mr. THOMPSON replied that the rents were from 1s. 3d. to 1s. 9d. per room. That included all the charges of all kinds. The scullery was not counted as a room. Ground rent, interest on capital, rates, repairs, maintenance expenses, and repayment of loan, were included in that.

Mr. BOND said that was very wonderful, and he really did not know how it was done. He would be glad to go into the matter more in detail. He did not himself find that they could put up a room and get 5 per cent. for their money for less than 3s. 6d. a room. The ground rent in London was no doubt heavier than at Richmond, but in other respects the conditions would be the same. If they wanted to help the poor they must cut their coat according to their cloth, and must be content to give them what looked at first sight rather scanty accommodation. Persons with an æsthetic eye or with high ideals as to what the accommodation for a working man's family ought to be would perhaps subject this to some rather severe comment, but they must not be deterred by that. They must make up their minds that if they were to house the very poor they must be content to give accommodation, which would lay them open to the criticism of which he had spoken.

A Delegate asked if rates governed the rents, what happened when a large number of houses were empty? What would happen if half of Mr. Bond's tenements were empty?

Mr. BOND replied that he did not intend to raise the vexed question of rates and rents. His Company expected to get a certain return for the money laid out, and in fixing the rents they had regard to that consideration. They could not get a net profit divisible amongst shareholders without taking into account the rate they would be expected to pay, and the rates were taken into account in fixing the rents. As a matter of fact they did succeed in making 5 per cent.

A Delegate asked if Mr. Bond would give them the rent of a room of 12 ft., and whether any account was taken of the question of the separation of sexes.

Mr. **Bond** said they did not refuse to let a single room to a married pair, and they would not refuse to allow them to occupy it with one or two small children. At the present time they dealt with the dwellings separately. They took the cost of each block, and considered with regard to each block what rent they had to charge in order to get the return they expected. If the blocks were built cheaply, as some of their earlier blocks were, their rents were rather lower than in the later blocks, but he would not expect to let such a room in London under present circumstances at much less than 4s. a week.

Another Delegate asked if Mr. Bond in his blocks of buildings found it necessary to group the water closets together, and whether he was able to get a separate water closet to each tenant.

Mr. **Bond** said they could not give a single room a closet to itself.

Mr. Councillor **Terrett** (West Ham) said he would venture to point out one or two facts. He thought they should carry a resolution at the meeting in support of getting loans for land for 100 years, and for buildings for sixty years, and also that they should carry a resolution in favour of the removal of the absurd restrictions which Alderman Thompson told them the Local Government Board imposed upon them when they wanted to deal with that question of housing. His Corporation (West Ham) were disciples of Alderman Thompson. They studied his book and then set to work, and they had gone ahead a good deal with regard to the administration of the third part of the Housing Act. They were a typical industrial borough just on the outskirts of London, and as they cleared the East End of London to build railways and warehouses, and as the London County Council cleared such areas as Boundary Street, districts like theirs found the displaced population gradually come to them, and they had the difficulty of the Borough being filled up with a large population who lived there, but did not work there—their work lay in London and they resided in West Ham. That resulted in bringing them face to face with a very large rate, and their rates were now 9s. in the £, but even if the tenement was rented as high as 10s. a week on the average, it did not pay for the education of his children. They were face to face with the fact that they had a constantly increasing School Board rate, and this all increased the difficulty under which they laboured with regard to the housing question. They had tried to tackle the question on the lines that Alderman Thompson had laid down, and they were now committed to carrying out schemes under the third portion of the Act for the housing of about 1,200 families. They attempted in addition to that to schedule a number of estates with a view to taking them compulsorily, under the Bill they had now got before Parliament, and what they found was that no sooner did they pass a resolution in the Council to schedule a particular estate, than the owners of it at once commenced to create additional interests. They commenced to lease some of it out, and commenced to lay some of it out with roads, and wherever possible they created an additional interest for which they would have had to pay compensation. Unfortunately on a poll in the Borough on the question as to whether they should take those estates, the Council was defeated by 9,000 to 8,500 votes, so that those who had speculated to receive compensation failed. At the same time it was a great difficulty, and one which that Conference should pass a resolution to deal with. Supposing a municipality saw a piece of land which the owner would not sell, or for which he asked a ridiculously high price, and the municipality decided to include it in a Bill to take it compulsorily, it seemed to him a shame that the Borough should have to pay compensation for interests created after the area was scheduled in the Bill. They should come to some sort of agreement that when an estate had been scheduled like that, there should be no compensation payable, if any interest was created after it was so scheduled. They were told that it cost 10d., 9d., and 8¾d. per foot cube to build on the Millbank site, and 8¼d. per foot cube to build on the Boundary Street area. Even allowing for the most extreme conditions of London building rates, that was a great deal too much. The Corporation of West Ham built fifty-four dwellings in Bethal Avenue. They planned three rooms and a scullery downstairs, and a similar tenement upstairs with separate doors for the bottom, and a separate door to the top, and also separate back yards. They built them by direct labour, and paid the men the London Trade Union wages, and in some cases considerably more, in spite of the fact that during the work they had a strike on the job, as to whether union men should work alongside non-union men. The cost only worked out at 6¾d. per foot cube for the first twenty of the tenements, and 7d. per foot cube for the last thirty-four. They had fitted up the whole of those tenements with electric light for which the tenants were charged an additional 6d. per week on their rent. They were now going on to build ninety more flats, and intended putting in those a bath in all the sculleries. They had let the building of these to a contractor, and the price of the work would be about 6¾d. per foot cube. The average rental they let at ran from about 2s. to 2s. 2d. per room, not including sculleries. He hoped to be able to let the houses they were now putting up at about 8s. for the top floor, and 7s. for the lower flat. The down floor consisted of a front room which might be used as a bed or sitting room of 15 ft. by 11 ft. 6 in. with a bay; the bedroom was 9 ft. by 12 ft., and the scullery 8 ft. by 13 ft. 6 in. They offered prizes to architects for a scheme for building flats nearer to the dock district, which they hoped to be able to let at about 5s. 6d. a week. Their greatest difficulty had been not how to carry out the scheme, but the bitter antagonism that they had met from interested parties in the matter and the wealthier sections of the Borough.

A Delegate asked the cost of land per acre or per room.

Mr. TERRETT said that the cost of the land at Bethal Avenue was about £850 per acre, but the land at Abbey Mills on which they were erecting houses cost about £900 an acre. The cost per room was as nearly as possible £75, not including the sculleries, and if they included the sculleries it would work out at £63.

The Delegate. That comes out at 7d. per foot cube.

Mr. TERRETT. Yes.

Another Delegate. Would that include street making?

Mr. TERRETT. The cost includes the making up of the roads.

Mr. C. J. HAIR (Southampton) explained he had had the honour of building a block of flats for the Southampton Corporation, but he did not know whether they would pay or not. Speaking generally, he thought that the corporations were at present trying to attain the impossible. They bought slum areas (and he did not see *why* they *should* buy them): he did not see why landlords should not be made to put their disgraceful slum property into repair. But corporations bought *these* areas at a great deal more than their value, and then cleared them and said they would re-house on them. They tried to please the medical officer of health and the Local Government Board, and tried to make it "PAY," and they could not do it. With the present high prices of materials and labour, corporations must make up their minds, that if they were going to re-build these unhealthy areas they must lay by a certain sum of money to do so. He did not understand why it was, that when corporations dealt with these schemes they should first buy the land, pull down the houses, and turn the people into the streets, and then begin to think about their plans, and perhaps in some three to seven years time begin to build on it. They turned the poor people into the streets and made things a thousand times worse. His point was: "Why not make your plans and then pull your houses down?" He thought the tendency now-a-days was to go from one extreme to the other. First they had the medical officer of health who wanted everything to be perfect—it was desirable, but it was unattainable. They could not afford to have the best of everything if the scheme was to be made to pay. Practically, the same thing could be obtained at a less cost, and they could still build sanitary houses. They could give everything necessary if only the Local Government Board would relax some of their very cast-iron rules, and he thought the medical officers of health might give way sometimes a little. The first consideration was as to what sort of dwellings they were going to build. Some people seemed to think nothing was possible but cottages, and undoubtedly they were the nicest and most comfortable dwelling for the working man, but he did not see how they were going to put up cottages in a big town—the land was too valuable. They must put up flats, and one of the causes of high cost of flats was the enormous thickness of walls required by the byelaws. They had had statistics as to what these buildings cost—how much per foot cube. The question however was where the cube foot was measured; did it measure right from the bottom of the foundation, because in Southampton they had to go down 20 ft. in some cases. Statistics were most misleading, for what would suit one case would not suit another. They had no balconies in their dwellings at Southampton, and he thought it was a great mistake. Medical officers of health said they were unhealthy as they kept the light out of the rooms, he thought that was a matter of aspect; a balcony would not obstruct any appreciable amount of light to rooms facing South or South-East, but they would be a mistake on a North aspect. Then it was very desirable that the working man should have a garden, but it could not be given in towns; if gardens were wanted the working man must live in the suburbs. But if no garden could be given they at least required a yard, where a good deal of washing and brushing clothes, &c., could be done out in the open air. In flats, balconies were the only substitute for a back yard. In conclusion, he would make a suggestion to people who had property. In many provincial towns there was a lot of shop property with only one storey above the shop, which was generally used as a lumber room. He suggested that the owners of property should build artizans' dwellings on the top of the shops, and let the tenants enter from the back. The land would then cost next to nothing as the rent of the shop would pay for it.

Alderman **Thompson** proposed, "That in the opinion of this Conference the Local Government Board should at once extend the period of repayment, actually granted to local authorities for building loans under Part 3 of the Housing of the Working Classes Act of 1890, to the full statutory period of sixty years, and that they should relax and vary the restrictions for building cottages, especially in the direction of enabling more rooms to be provided at a less cost per room where this can be done without prejudice to considerations of sanitation and safety; and (2) that Parliament should be asked to extend the period for the repayment of housing loans to 100 years in the case of land, and facilitate the advance of money by the Public Works Loan Commissioners at the market rate of interest for the purpose of housing the working classes."

Mr. W. B. **Harris** (Sleaford), labour representative, Kesteven C. C., seconded the resolution, and said that was a village question as well as a town question, for all the village habitations were not of the most sanitary character. They had had a very startling case in the county of Lincoln. The Corporation of the City of Lincoln wanted to build twenty workmen's houses to let at from 3s. to 4s. per week to men who were earning less than £1 per week, but the Local Government Board with their red-tapeism spoilt the scheme, and smote it hip and thigh. The plans were better plans than that required under the bye-laws of the city. The Corporation passed the plan and sent it to the Local Government Board, and they sent it back. Some of the alterations were agreed to and the plan was sent to the Local Government Board again, and the Board returned it and insisted on such stupid regulations that they could not possibly pass it, and they could do nothing. What they wanted was to legislate for their own areas without interference from the Local Government Board. In the town of Sleaford he had originated a building scheme, but the building was not the barrack warehouses such as they had viewed the previous day. The ground their dwellings were built upon was 132 ft. in length by 30 ft. for two houses. They could build them at £30 a room if they could get the Local Government Board's sanction to borrow the money, when, by monthly instalments, they would be their own freeholders for the land in six years. It was none of the Jabez Balfour business.

Every man obtained possession of his own plot as soon as the land was purchased; he could either build or cultivate it just as he pleased. The freehold was laid out and the plots balloted for, each man paying £10 per cent. deposit on his plot. Up to the present they had applied to a solicitor individually, and he had advanced the money to build the houses, but they should like the privilege of borrowing the money from the Public Loans Works Commissioners under the sanction of the Local Government Board. The plots of land cost from £25 to £60 each; inclusive of streets and drains. Sixteen acres of land had been purchased by his society, all of which had been allotted. They had no ground-rent in Lincolnshire.

A Delegate asked what was to prevent the land owner leasing the ground and becoming ground landlord.

Mr. HARRIS: The documents or deeds we can produce. No one would take it on such terms to build upon.

Mrs. MAURICE DOCKRELL (Deputy Vice-Chairman, Blackrock, Co. Dublin) remarked that the elementary principle they wanted to establish firmly in their minds was, that given the standard rate of wages in any district, rents should fall to such a point that every family would be able to procure a home, and that they must demand that no greed of gold or condition of trade should be allowed to crush out the home from which would come forth citizens as they would like them to be.

She had been greatly interested in what she had seen the previous day; but she must confess also to having been disappointed, the residuum that they most want to deal with appeared to have been left untouched.

All their efforts seemed to have no further result than that produced by a man turning water into a pail, he shifts the position of the water, but doesn't alter its bulk. They shift the position of the housing problem, but never solve it.

Every element operates against the poor. Lack of suitable dwellings produces over-crowding, and over-crowding sends up rents. Over-crowding also causes slums, and where there are slums the rates are high, and high rates again means so much more rent. For an addition of a 1d. a week on the rates the slum landlord must have 2d. or more from the tenant. She had heard a great deal about taking the poor from the towns and housing them in the suburbs, and was quite aware that business prosperity was pushing back the poor from the centre of our cities; but the pressure on the one side would not meet with sufficient relief on the other. Some might migrate to the suburbs, but in her opinion, these would be the aristocrats of the labour class. The residuum, those who depended on local employment, or those engaged in the badly paid and sweated trades, felt that they must remain near the centre, for their day of fourteen hours left no margin of time or strength for travelling to a better home some distance away.

They must remember that this class, ignorant, and sometimes depraved as well as poor, would economise in house room and rent before anything else, regardless of the consequences to themselves or their neighbours; these can only be lifted up and educated by degrees to appreciate the blessing of good homes.

It seemed to her that municipal and urban authorities were sometimes inclined to proceed too fast, and to run amuck with this building craze. It was often better to untie knots than to cut them, and she would suggest, that a great deal might be done by putting the provisions of the Public Health Acts (defective as no doubt they were) patiently and firmly into operation.

The only dwellings, which as far as she knew, had got down to the poverty line, were the Guinness Trust Buildings, which supplied rooms from 1s. 6d. each, and three rooms for 5s. There was a water tap on every landing, sanitary conveniences for every two families, and a laundry for every four or six tenants. There were bath rooms attached to every block, a club room for men, a shelter and playground for children. In addition to the rent, there was a payment of 3d. per week for Venetian blinds, bath room, club room, chimney sweeping, and a continual supply of hot water.

Income of tenant £1 per week, if above 25s. considered sufficient to enable him to live in other houses. The Trust expected a return of 3 per cent., which went to erect more buildings. It aimed at a particular class and regulated its rent according to the amount of their income.

Mr. A. B. McDonald (City Engineer, Glasgow) said that the experience they had had in Glasgow in dealing with the question was very different to what they had heard, looking to the cost of the construction of the buildings, and the rents at which they were able, without loss, to let them to those for whom they were intended. The previous day it was with something approaching incredulity that they heard 8d. and 9d. per cubic foot quoted, for they in Glasgow had built better houses, and the cost per cubic foot was from 4¾d. to 5½d., the construction being of stone, with in some cases an architectural frontage. In one case where they had to go down for their foundations 25 feet, the cost per cubic foot only rose to 6½d. Those houses were all built in centres that were surrounded by an industrial community. None of them were placed in remote positions at all, and they were built on land which cost from £7,260 to £14,520 per acre. The rental of these houses varied from 1s. 6d. to 2s. per room per week including all rates, and the erection of numerous blocks in different areas of the city had been accomplished without imposing any burden on the taxpayers. He hoped that members of the Conference would not only examine their plans, but in case any of them were in Glasgow, in the course of their investigations he was sure he had the authority of the Lord Provost in saying that he would be very glad to show them what they had done. Apart from the work already accomplished in those industrial centres, plans were about to be commenced in positions a little more remote, on land costing from 10d. to 1s. per square yard, *i.e.*, from £200 to £250 per acre, where the results he hoped would be even more successful than they had been in the past.

A Delegate: Could you give us a definition of a Glasgow house?

Mr. McDonald replied that a Glasgow house was, in their opinion, a more desirable habitation than any tenements they saw the previous day. They had what they called a one-roomed house provided with a scullery. They had houses of two and three rooms, and the two-roomed houses had each a water-closet to itself. The one-roomed house had a water-closet for two occupants, and in every building the planning was of a very liberal and spacious sort, far in advance of the requirements of the Local Acts, which were far in excess of the ordinary Imperial requirements.

Mr. Bernard Shaw (St. Pancras Vestry) said he rose because he wanted to put before them the view of the public man as against the view put before them by Mr. Bond. Mr. Bond had told them that from the point of view of the private investor, when they put up a block of dwellings for the working classes and made the rent too low, or were too extravagant in building, and the rents therefore did not yield an appreciable return upon their capital, such an enterprise was unfruitful. Now the public man looked at it from another point of view. If the local authorities rehoused the people decently, then, although they might not be able to get a penny of direct money profit, there might yet be a tremendous saving to the community. If the result of putting up dwellings was that a number of persons who had been pigging wretchedly together were now living in a more decent fashion, not only was the enterprise fruitful to that extent for those persons, but there was a considerable advantage to the ratepayers by the reduction of expenditure, both public and private, incurred through disease and crime. It did not pay to save money by neglecting the housing problem and spend twice as much on police courts, infirmaries, and doctors' bills. In his own experience, when living in lodgings in the earlier part of his life, he had noticed that when two persons, however respectable, attempted to live in one room, they always beat one another sooner or later. He put it in all seriousness that a great many crimes of violence were due to intolerable trials of temper caused by people having to use a single room for all purposes, and never being able to escape from one another for a moment. As to the gain in cleanliness, he was afraid to say anything about that in the presence of Dr. Collins, when they had found on their visit to Boundary Street the day before, that the London County Council fined its tenants 1d. for taking a cold bath and 2d. for taking a hot one; and the baths were as ugly and uninviting as if the place were a prison. Mrs. Dockrell said they already had Public Health Acts and other Acts which might be put in force. Now it was true the legislation they had at the present time was quite sufficient, if carried out, to deal with the whole problem; but there were two difficulties in the way of carrying it out. First, if a local authority attempted to put the Acts into force, which would mean turning crowds of its constituents homeless into the streets, its members would never be re-elected. Second, if in order to guard against that they made an alteration in the constitution of the country so as to make the members of the vestries perpetual members, there would be a revolution. What they had to deal with in many places was something which had hardly been alluded to in the Conference, and that was overcrowding. Every person had spoken as if the only question was that of re-housing; but supposing there was an area overcrowded—supposing they had an area on which 1,000 people only ought to be housed, and there were 1,500 on that area—who were the people who ought to go? That was a question which had never been faced. If they took the parish of St. Pancras, it might not be overcrowded as a whole; but there were certainly parts of it which were overcrowded; and the question was, who was to leave the parish to make room for the rest? Most people took it for granted that the working classes would have to go, but he was not convinced. He would send away the people who had short hours of work and time to travel up and down from the suburbs. But if they were going to do that, they must have power to build not only cottages for the working classes, but to build villas for the people of the better-off classes, and get them into the country, and then adapt the houses they left for the use of the working classes. Of course they could not compel anybody to move; but they could enable people to move by providing houses for them in the country; and experience showed that the middle classes were more willing as well as better able to move towards the country than the labouring classes. As long as they attempted to deal with the question of housing by the present ridiculous class legislation, confining them to working class dwellings and unhealthy areas, they would never solve the problem. In conclusion, to put himself in order, he very heartily supported the resolution as to the Local Government Board, because of late years they had created an immense number of new local bodies. They had created parish councils, county councils. and a tremendous machinery of local government; but in their English way they had done that without thinking that such a multiplication of local authorities necessitated a corresponding improvement in the Local Government Board. He almost wished that Mr. Thompson had made his resolution a little stronger, and conveyed to the Government that if they did not improve their central machinery the members of this Conference would be regretfully compelled to go back to their constituents and advise them that, before anything could be done, they had better try a mild revolution, to bring that obstructive and incompetent office to its senses.

Dr. W. J. COLLINS (London County Council) observed that he would certainly convey to the body, which Mr. Bernard Shaw was good enough to attack with his invective, the remarks he had made; but he would remind Mr. Shaw that all the members of the County Council could not be made responsible for the virtues or sins of that much criticised body, any more than Mr. Shaw could be taken to adequately represent all the views entertained by that enlightened body, the St. Pancras Vestry. He had already learned many things since he entered the room. He learned with admiration, and had a desire to emulate—although it seemed impossible in London—the figures of the chief engineer of Glasgow. In the matter of housing of the working classes, he was afraid it was not possible under existing conditions in London to imitate Glasgow. He agreed with many of the remarks as to the unnecessary restrictions to which local authorities, including the London County Council, were subjected by Government Departments. Both the Local Government Board and the Home Office had exercised their powers in an arbitrary fashion, and in a fashion which varied from time to time and was very perplexing to their officials.

He largely agreed that the housing question was to a great extent a wages question; he would be the first to put up houses for wage earners receiving less than £1 per week, but he confessed that under the present financial restrictions, that was practically impossible without a charge upon the rates. He felt that the housing question was also a sanitary question, and it would not do to leave Lazarus lying at the door of Dives, for if over-crowding and insanitation continued unchecked, Lazarus would retaliate on Dives by way of epidemic disease, which ignored alike geographical boundaries and orders of the Local Government Board. He must say, in conclusion, that he took heart from the conference that day, for things were very different now to what they were fifty years ago, when Shaftesbury, Southwood Smith and Chadwick, were as voices crying in the Wilderness. When the Metropolitan Board of Works was founded in 1855, the housing of the poor was not considered to be a question for them to deal with at all, but it was now recognised as a municipal duty to grapple with the great question of the housing of the working classes, in the earnest and practical way in which this Conference was addressing itself to the problem.

Mr. I. YOUNG (Chief Sanitary Inspector, Battersea) said it appeared to him that most of the remarks which had fallen from the speakers both to-day and yesterday, had been with a view of providing new houses for the working classes. Hardly any mention had been made as to what should be done with existing working class dwelling houses. It appeared to be generally considered that the sanitary authorities have sufficient powers to enable them to deal with these, but as an inspector of many years' experience, that was not his view. If their powers were sufficient to deal with insanitary houses, then he was of opinion they were not sufficiently supported in their statutory duty by those who constituted the Court of Appeal—he meant the stipendiary and other magistrates. Although the provisions of the Public Health (London) Act were very explicit in stating the duty of the sanitary authority, it gave a permissive power to the magistrates, consequently, when the authority had carefully considered cases in which insanitary conditions were found to exist, and had made their order in regard thereto, the case was practically re-heard by the magistrate, and it not infrequently happened that his decision was given in favour of the defendant. His contention was that after a proper survey had been made of insanitary property, and the officers had reported to their authority the conditions that existed, the sanitary authority should have the power to say whether it was classes for whom housing accommodation was required was, he thought, the class known as the "poor" labouring class, whose weekly wages were less than twenty shillings per week, and who, at the best, could earn only a precarious living. There was, of course, a still lower class who could only be provided for in Common Lodging Houses, and unfortunately, a class even lower still who were provided for in the workhouses.

The artizan and skilled workman can command a better wage, which enables him to pay a rental which will always induce private enterprize to provide him with the necessary housing accommodation.

It is the man who cannot afford this rental, who has a difficulty in finding a home, to whom our energies should be devoted.

(2) The answer to the question as to where these houses should be erected is, of course, as near to the man's work as possible.

This, owing to the value of land in all industrial centres, is almost impossible, and consequently it would appear that the only solution is to spread the population by means of quick and cheap transit by tram or train.

Much however might be done if existing insanitary property could be acquired and destroyed by the local authority as unfit for the purposes of a dwelling, and therefore of no value except as bricks and mortar, but this would not affect the value of the land on which it stood, unless it could be held that the land was used for an improper purpose.

An insanitary dwelling-house is as dangerous to the community as an offensive trade, and should be dealt with in a summary manner.

(3.) The answer as to what description of dwelling should be erected is one that can not easily be given in the course of a few short remarks.

Many millions of pounds have been spent by private enterprise, and by local authorities, in the endeavour to provide accommodation for the labouring classes with more or less success, but hitherto very little has been done to grapple with the real problem of building homes for the poorer labouring classes he had described.

The class of dwelling hitherto erected had been nearly always of too elaborate a character, too attractive, too good, if one may say so, and too expensive in rental to attract the class for whom the provision is really required.

This class are naturally not desirable tenants, they ar uncertain in paying their rents, often dirty and careless i their habits, even destructive to property in a drunken braw and are not unknown to sometimes break up the wood-work f fire-wood. They are not a class of tenant to attract private enterprise except in dwellings which are practically unfit for decent habitation.

It is to meet these and many other difficulties that is the real problem which has to be solved.

What description of accommodation should be provided for this description of tenant, and what rent can they afford to pay?

The accommodation must be simple and even unattractive, or otherwise a better class tenant will be attracted; the rent aimed at should, if possible, approach some such unit as one shilling per room per week.

Can this be done without taxing the more fortunate or harder working members of a community, under existing circumstances?

It certainly cannot if the price of land exceeds a certain limit, but he believed it could be done with land of the value of about 15s. per square yard.

The building may be either of the "block" type, or preferably, rows of self-contained cottages, two or three storeys in height, with two and three-roomed tenements.

The rooms must not be too large or lodgers will be introduced, there need be no larder, as this class of tenant has veritably to live "from hand to mouth." There need be no copper for washing, as what little fuel is bought is used for cooking, and washing may now be done at the nearest public wash-house. The living room may be the kitchen, as this class of tenant always makes it so. There should be, however, a scullery, the smallest possible size will do, fitted with a sink and cold water tap.

There is no need for a hot-water tap as this means a boiler and extra fuel. Any hot water required can be heated in a kettle or pot on the sitting-room range which should, of course, have a small oven and hot plate. Each tenement should, if possible, have a separate w.c., as otherwise there is no one responsible for keeping it clean. All the plumbing must be the best possible, but no lead must be used, and everything must be strong and unbreakable. The buildings should be of plain but good brick. There is no necessity for plaster on the inner walls, with good brickwork a bright colour wash is all that is required.

The floors should be of concrete, with grooved and tongued floor boards or pitched joints and absolutely impervious, as the tenant can hold his landlord responsible for any damage he may sustain from a careless tenant overhead. There should be as little woodwork as possible, and the doors should be thick "ledged" doors not easily broken. The windows should have very small panes of glass so that repairs may be very cheap, but they must be large and easily opened for light and air.

All stairs, window heads, door cills, and any "dressings" should be of concrete.

These are a few suggestions of many that could be made for cheapening construction, and he believed that it is in this direction and in *this* direction alone that the problem can be solved. It is no doubt perfectly right to have an "ideal" as to how these people ought to live, but it will take many years of education to bring them up to a high standard.

At present they do not like large rooms, they are difficult and expensive to keep warm. They will not live in a number of rooms, they prefer to herd together. They cannot pay the rents demanded for "Model Dwellings," and consequently do not live in them.

He was afraid that a great many people approach this problem from their *own* standpoint, and not from the standpoint of those whom they are anxious to serve.

So long as this is done the problem will remain unsolved, and the poorer labouring classes will live in cheap hovels if they can be found. If cheap dwellings could be erected for them they will occupy them, but if they are made too good the better class will give them a trifle to turn out and occupy them themselves, and the problem will be as far off solution as ever.

There is of course the very difficult question of the value of land.

This is a matter which can only be dealt with by legislation, and any interference with the laws of Political Economy generally brings some retribution.

He had endeavoured in these few remarks to point out the difficulties besetting the question of Housing the Labouring Classes, and he had endeavoured to show that unless we modify our ideas as to the manner in which their dwellings are to be erected, the problem will remain unsolved.

Dr. COOPER moved, and Dr. SYKES seconded, a hearty vote of thanks to Sir Sydney Waterlow and to Mr. Blyth for occupying the Chair, and this having been carried, the Conference ended.

VISIT TO THE ARTIZANS' DWELLINGS IN THE BOUNDARY STREET AREA, BETHNAL GREEN.

The Boundary Street Area, principally in Bethnal Green, was condemned by the London County Council in November, 1890. It is about 15 acres in extent, and at the date of its condemnation the population was 5,719. The death-rate at that time was 40 per 1,000 for this area, as compared with 22·8 for Bethnal Green Parish, and 18·8 for London as a whole. The houses were crowded together, and most insanitary in character. The streets varied in width from 12ft. to 28ft. The Council purchased the entire area, with the exception of a large factory, and the schools and churches; the old roads have been obliterated, and new tree-lined avenues 50 and 60 feet in width substituted. There are now 925 tenements in lieu of the 730 houses formerly existing on the area, and these new tenements provide accommodation for 5,380 persons. The radiate from a circus with a central garden 270 feet in diameter. The new buildings are of very varied character, some being associated, some self-contained, while tenements varying in size from one to six rooms are provided. Each tenement of more than one room has a private w.c. There is a Central Laundry fitted with the latest steam appliances, and therefore clothes are not permitted to be dried about the various buildings, shops, and workshops; accommodation for bicycles and perambulators is being placed in suitable positions. Club rooms for the use of the tenants have been constructed. Great care has been taken to preserve efficient lighting and through ventilation in all the rooms, and the drainage and sanitary arrangements have been carefully considered. Gas is laid on to all the rooms, and in some buildings, baths and hot water supply are arranged upon each floor.

The cost of the scheme, including cottage dwellings for 144 persons in Goldsmith's Row, was:—Purchase of properties and value of land, £333,000.

The financial aspect of the scheme has received close attention. Estimates of the probable receipts and expenditure are prepared in respect of each building by the Valuer to the Council, and the figures at present published show that the rents of the buildings will pay the requisite interest upon the value of the land, the cost of the buildings and the architect's expenses, and will in addition pay an annual contribution towards a Sinking Fund, which will enable the entire capital now raised to be paid off in 60 years. At the expiration of this period the nett receipts from the area will become municipal income.

The general scheme and the designs of all the buildings, except two, have been prepared by the Superintending Architect of the London County Council.

The plans facing page 452 shew the area both before and after the carrying out of the scheme by the London County Council.

MUNICIPAL WORKMEN'S DWELLINGS, RICHMOND (SURREY).

The Council possessed a strip of land adjoining the L. & S. W. Railway, at the level crossing in Manor Road, containing 6 a. or 36 pls., and costing about £700 per acre. It was about 1,070 feet in length, and its width varied from 210 to 290 feet. In 1892 a scheme was proposed, and on the 30th August, 1893, a loan of £13,380 for works was authorised by the Local Government Board for forty years, and a loan in respect of the land for fifty years.

A road 40 feet wide has been made up the centre of this strip, and 62 cottages have been built on either side, in blocks of 6 and 8, with passages between and behind.

The cottages are within fifteen minutes' walk of Richmond and Kew Gardens Railway Stations, and not more than twenty minutes from Mortlake Railway Station. They are in a working class neighbourhood, where cottages and double tenements let readily.

The objection to tenement houses generally is, that there is a common staircase and a common back yard. This has been avoided in planning the tenements. Each tenement is as entirely private and distinct from the other as if it were a separate cottage.

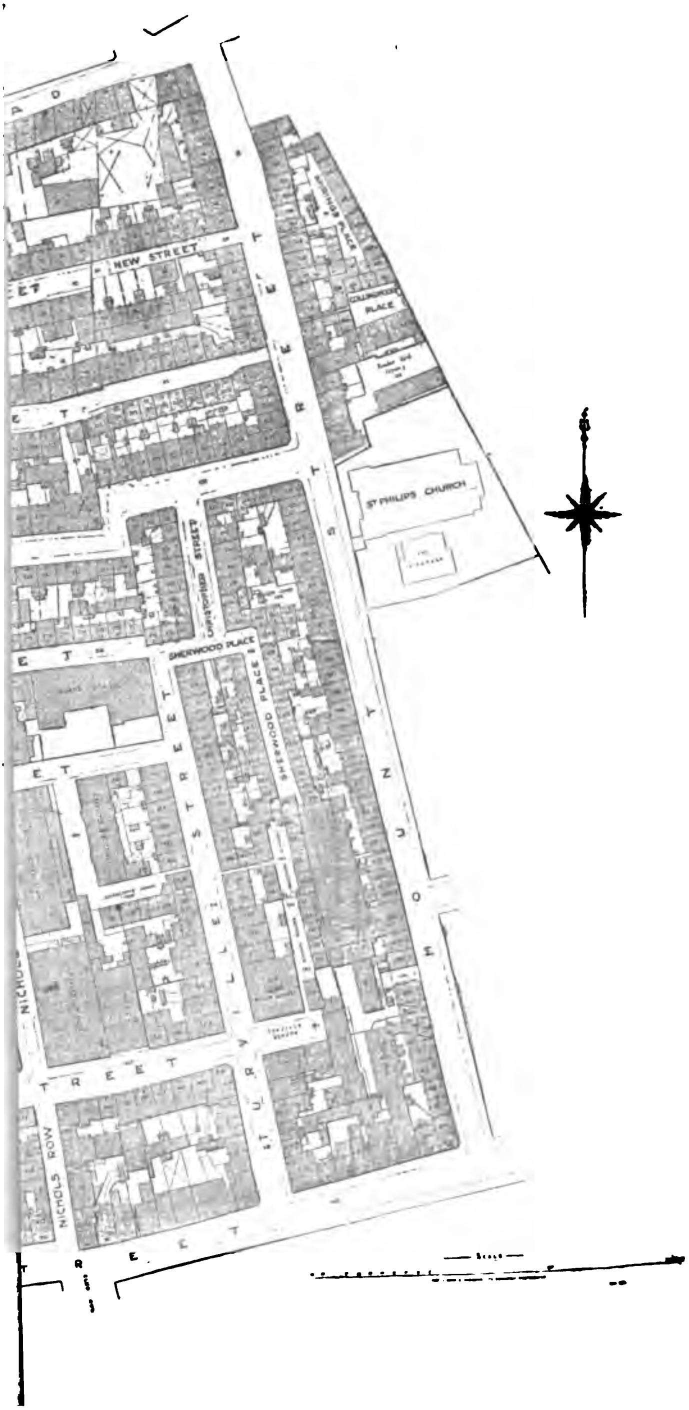
The cottages as erected are divided into three classes, viz.:—

Class A.—22 seven-roomed cottages in one block of four and three blocks of six each, ten being let at 8s. per week and twelve at 7s. 6d.

Class B.—28 five-roomed cottages in two blocks of eight and two of six each, let at 6s. per week.

Class C.—Six double tenements, three and four-roomed dwellings respectively, in two blocks of three each; let at 4s. 6d. and 5s. 6d. per week.

Total—62 tenements containing 336 rooms, each house having in addition, coal store, larder, and w.c., and an average area per each tenement of 56 yards super. (*See plans, pp. 453-459*)

NEW STREET
CHRISTOPHER STREET
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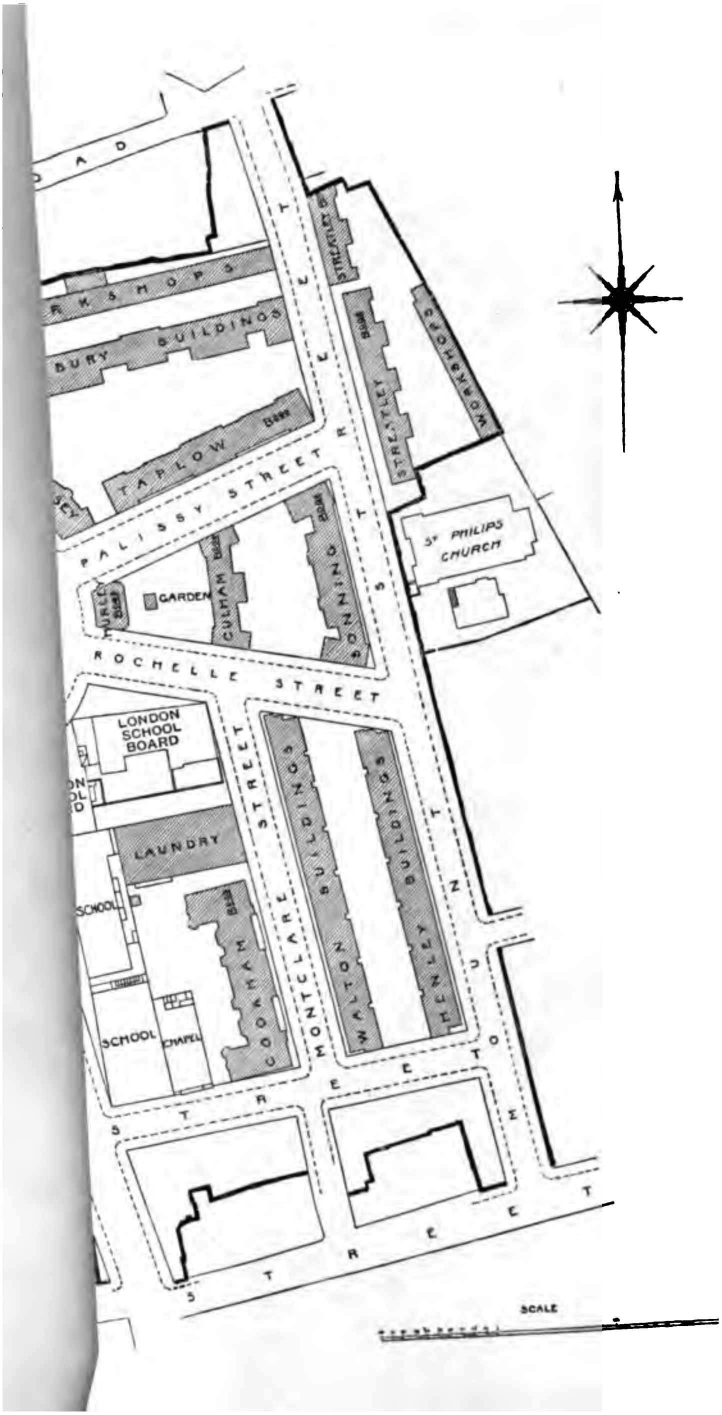
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TURLE Bdgs
GARDEN
CULHAM Bdgs
DONNING Bdgs
ROCHELLE STREET
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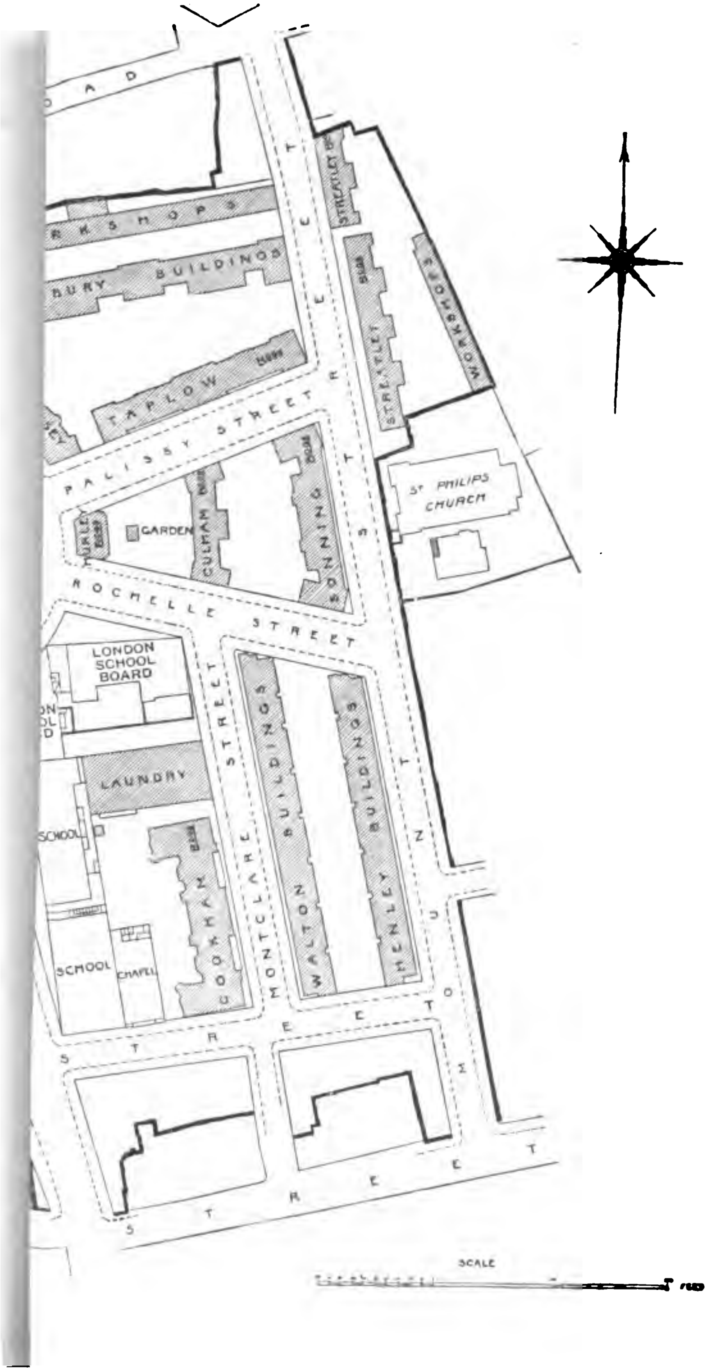
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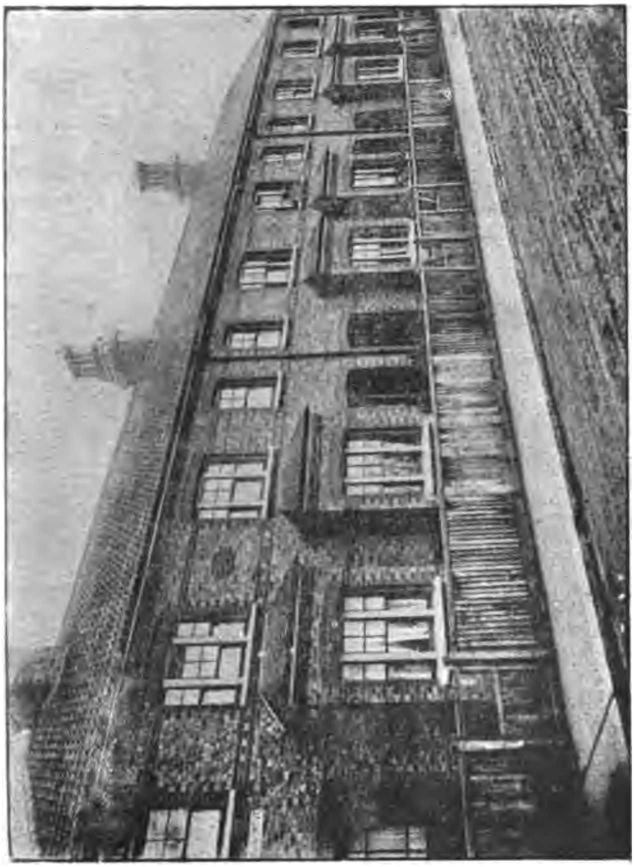
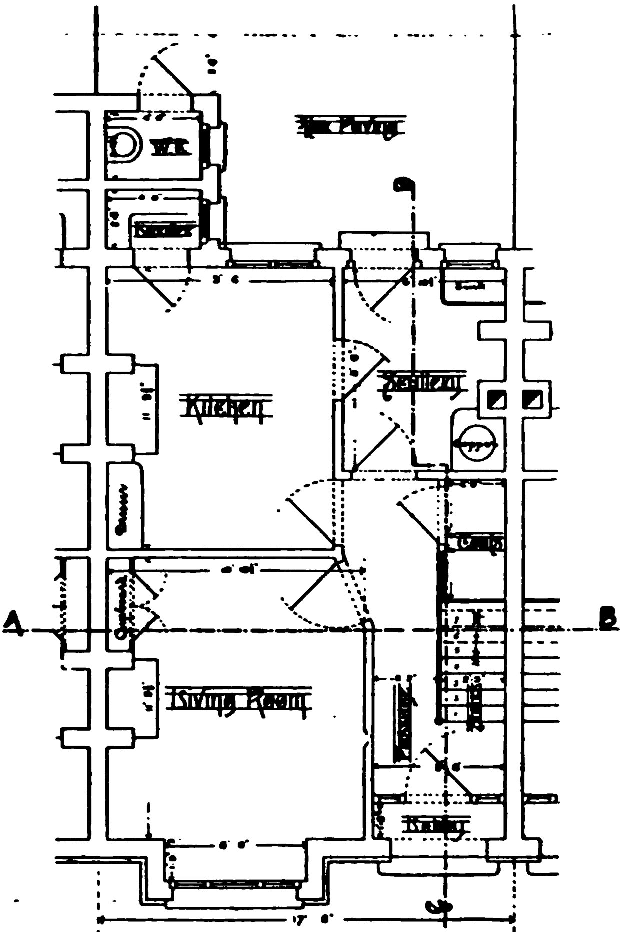


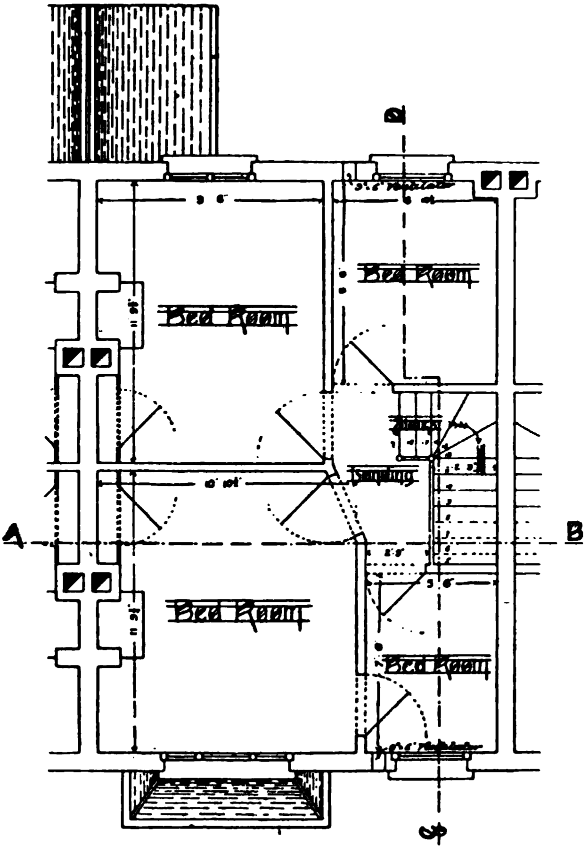
WORKMEN'S DWELLINGS—RICHMOND, SURREY.

COTTAGE—CLASS A.



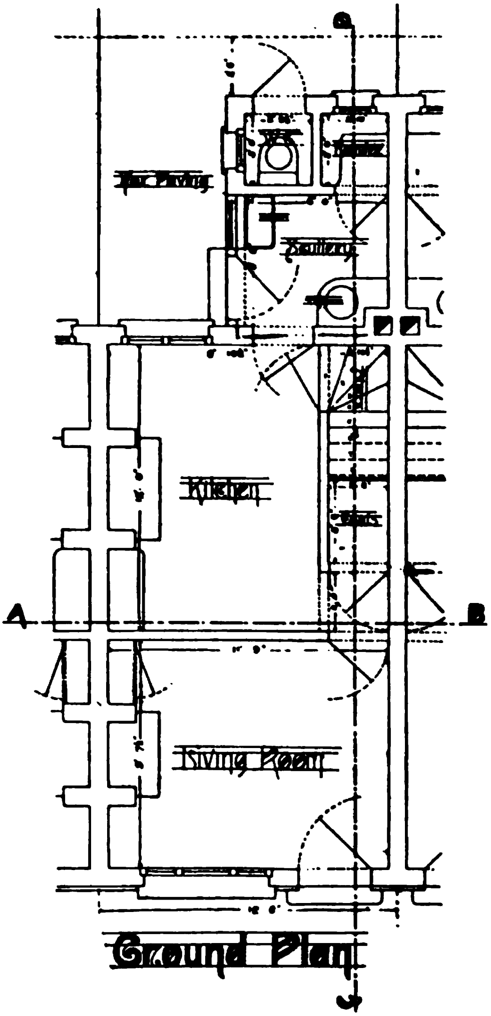
Ground Plan

COTTAGE—CLASS A.

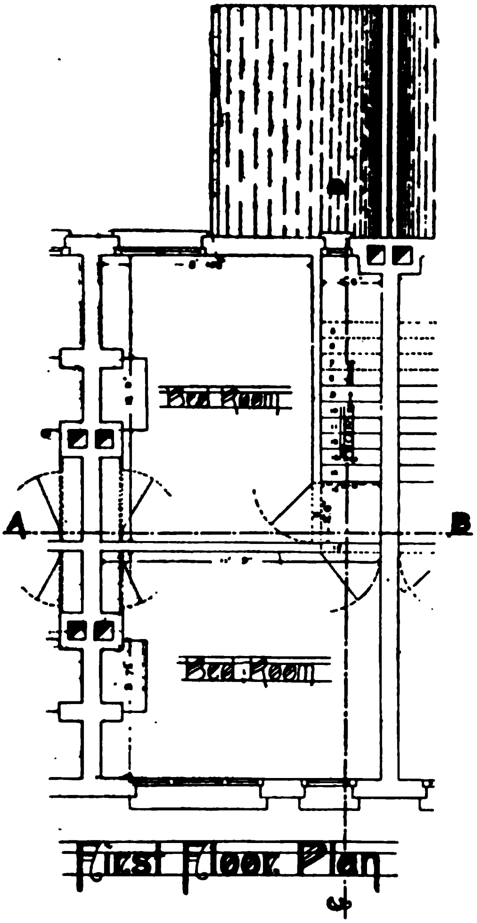


First Floor Plan

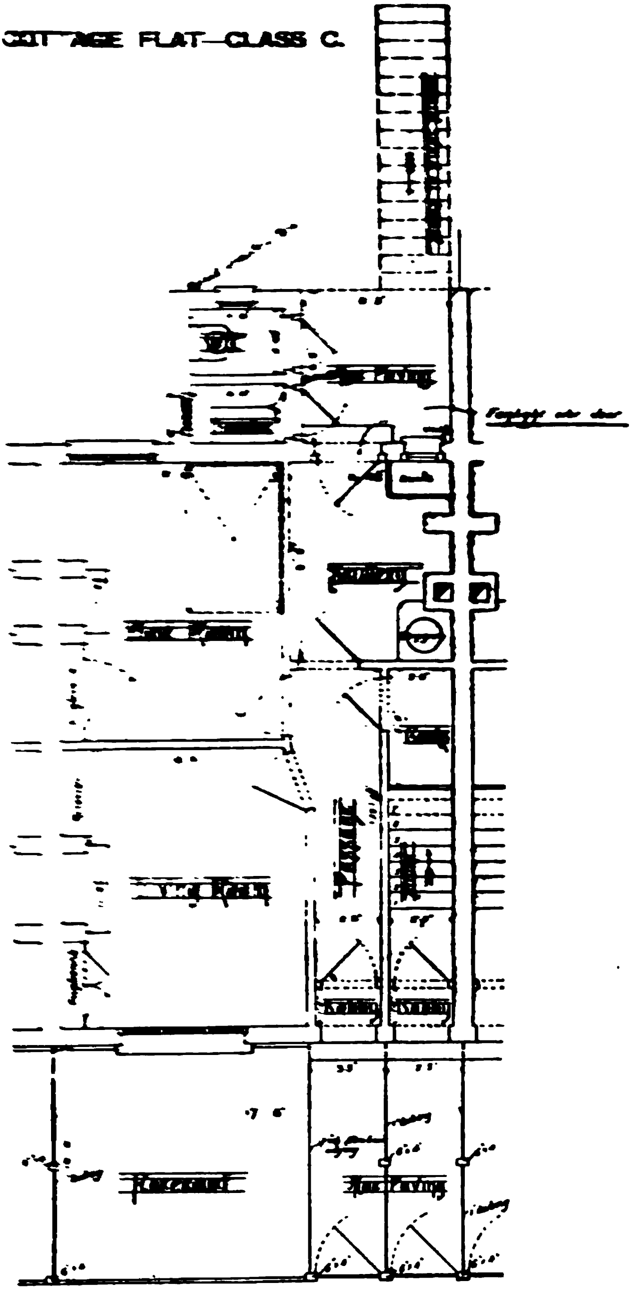
COTTAGE—CLASS B.



COTTAGE—CLASS B.

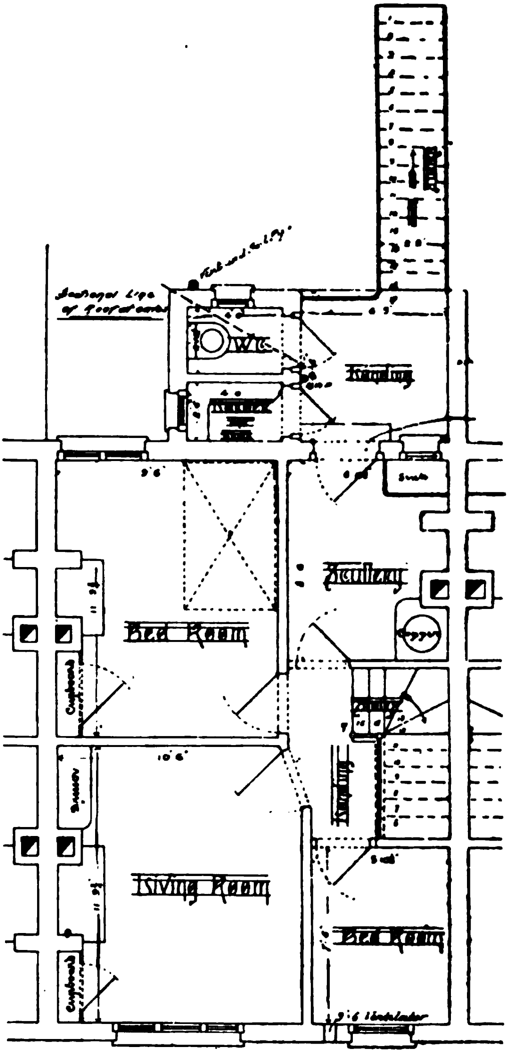


COTTAGE FLAT—CLASS C.



Ground Plan

COTTAGE FLAT—CLASS C.



First Floor Plan

Each cottage has a 10 ft. forecourt and a tar-paved footway leading up to the front door. There is also at the rear of each cottage a garden of the full width of the house, the average length being 24 yards, a space of 9 ft. immediately adjoining the house being tar-paved. In the case of the Class C (tenement) cottages, the gardens are divided longitudinally into two equal parts. Separate entrances are provided at the side or rear respectively of each cottage, giving access to the gardens.

The boundary and division fences and gates to forecourts and flanks of roadway are of oak sawn paled park fencing, 3 ft. 6 in. high, and those at the rear to flanks and divisions of gardens are of weather boarded fir, 6 ft. high for the first 10 ft., and 3 ft. 6 in. high for the remaining length.

The drainage has been laid throughout on the combined system (there being no available outfall for surface water) with Doulton's "Tested" stoneware pipes laid in falls of 1 inch in 30 and 40 respectively, with the necessary disconnecting and inspection manholes at each angle or deviation.

The water-closets are Doulton's combination pedestal closets, with a two-gallon water-waste preventor flushing cistern.

A 75-gallon galvanised iron cistern and a 9-gallon copper in scullery are provided to each cottage.

The total amount expended on each class, including the cost of fencing, drainage, and paving, but exclusive of road-making, sewers, and cost of site, was as follows:—

	£	s.	d.
Class A, 22 cottages	5,547	6	0
Class B, 28 cottages	5,213	5	0
Class C, double tenements (6 cottages)	1,931	17	0
	£12,692	8	0

The total capital outlay in round figures was:—

Land	£1,950
Roads and sewers	750
Legal charges, plans, &c.	200
Building (including Clerk of Works) ...	12,850
	£15,750

The average expenditure and income for three years of first portion of scheme is as under:—

Income.	£	s.	d.	*Expenditure.*				£	s.	d.
Total possible rents ...	1037	8	0	Interest				456	1	4
Less actual empties and arrears	0	10	6	Repairs				95	1	6
	1036	17	6	Management and Sundry Expenses				33	6	9
				Rates, Taxes, and Insurance				200	0	0
				Profit—						
				(A) To Sinking Fund	183	0	0			
				(B) Net Profit	69	7	11			
								252	7	11
	£1036	17	6					£1036	17	6

A second portion of the scheme consisting of 70 cottages and one shop has just been completed. This will bring up the total outlay to £37,900.

MEETING IN PARIS.

ADDRESS

By Professor N. GRÉHANT.

(President of the Société Française d'Hygiène.)

It is a great pleasure to me, and I also feel it a great honour to be called upon in the name of the Société Française d'Hygiène, to receive the members of the Sanitary Institute, and to offer them a welcome to the beautiful galleries of our permanent Exhibition of natural treasures, to which we are constantly adding.

You are all animated by the same spirit which inspired the late Dr. Pietra Santa, the founder of our French Society of Hygiene. He worked heartily with all those who were anxious to enter the lists to fight the numberless enemies who menaced humanity; we are all convinced that the splendid hygienic measures—the result of the work of physiologists, doctors, engineers, and architects, work in which we are all associated—have reached a high level in preserving health and lengthening life.

Among the many arch enemies of mankind there are three of which I have made particular study: Alcohol, Carbon Monoxide, and Fire-damp.

Alcohol I have injected into the blood of an animal and recognised it again in its stomach; the proportions remain constant in the blood during several hours.

Carbon Monoxide:—Following Felix le Blanc and my illustrious master Claude Bernard, I have advanced the knowledge of toxicology by measuring the quantities of carbon monoxide that can be found in the blood of an animal that has breathed a mixture of this gas with air in the proportion of from 1 in 1000 to 1 in 10,000. There is a certain rate of absorption which enables one to use animals as the surest and most sensitive re-agent, experimenting with doses of toxic gas in a confined atmosphere.

Lastly, Fire-damp, notwithstanding the marvellous and continued progress which science has made in recent years, still claims many victims among the workmen employed in the raising of coal, so much of which is used to meet the constantly increasing demands of industrial and domestic purposes.

I have carried to perfection the grisoumètre of Coquillion, and I had an instrument constructed by Golaz, which is so exact and sensitive, that in an atmosphere containing only $\frac{1}{100}$ part of fire-damp, the record on the instrument is equal to ten divisions; and $\frac{1}{1000}$ part of fire-damp can be detected by a record equal to one division.

The same instrument may be used for estimating carbon monoxide, and I often use it in my researches. I will presently show you this instrument in action, in another amphitheatre which is supplied with electricity, gas, and water.

Before concluding and giving place to Prof. Corfield, the President of this meeting of the Sanitary Institute, I will have thrown upon the screen the portraits of the honoured savants who have preceded us in this work. Among these you will recognise some of your own countrymen, all great men, whom we are happy to remember gratefully, because they have opened up new horizons, so to speak, unlimited horizons for the benefit of mankind. It is in the Congresses, brought about by our brilliant Universal Exhibition of 1900, that the scientific men and the workers of all countries learn to know and to esteem each other, and to lay the foundation for the re-establishment and maintenance of universal peace.

ADDRESS

By Prof. W. H. CORFIELD, M.A., M.D.Oxon., F.R.C.P.Lond.

(Vice-President of the Institute.)

PRESIDENT OF THE MEETING.

N the first place it is my duty to thank you, Sir (Professor réhant), as President of the Société Française d'Hygiène, and hrough you that Society, for inviting the Sanitary Institute to old a Conference this year in Paris in connection with your ociety, and to thank you personally for your cordial address of elcome.

It having been decided, for various reasons, not to hold a Congress of the Sanitary Institute this year in England, the Council had the greatest pleasure in accepting your kind invitation, especially as the meeting could be arranged to take place immediately before that of the Tenth International Congress of Hygiene and Demography.

I think that nothing more appropriate or of happier omen could happen in connection with the two Societies, and I hope it is only the beginning of more continuous and intimate relations between them.

I consider that cordial intercourse between scientific men of various countries is a most important, and will in future times be a still more important factor in forming cordial relations between different countries. The interchange of visits between the French and the British Associations for the Advancement of Science last year was a most happy beginning in this direction, and I am glad to think that we are following it so soon, and I hope that the Sanitary Institute will soon welcome the Société Française d'Hygiène in London.

It was with great pleasure that I acceded to the wish of the Council of the Sanitary Institute that I should be the English President on this occasion, and I may be permitted to think that there is some appropriateness in the choice of the Council. My study of Hygiene began in Paris in 1868, when I attended the lectures on Hygiene given by Bouchardat, and worked at Hygienic Chemistry in the Laboratory at the Collège de France under Berthelot. It was while I was working in Paris that I was elected at University College to the first Chair of Hygiene established in London, and dear old Bouchardat used to address me as "le jeune Professeur," while we students affectionately called him "le père Bouchardat." I was very much impressed by his teaching, and I feel that his lectures have an influence on my own even at the present time. He has gone from us, but I am happy to know that my old master, Prof. Berthelot, is still with us.

But to return to my subject.

Many of you know the Sanitary Institute by name, and perhaps some of you know something of its work; but it has been thought well that I should on this occasion draw your attention to the history and working of this by far the most important Sanitary body in the United Kingdom.

Attention was prominently called to the importance of sanitation in England in 1844 by the Reports of the General Board of Health, of whom Mr. (afterwards Sir Edwin) Chadwick was the guiding spirit; but sanitary work in London may be said to have commenced in earnest in 1855, when the Nuisances

Removal and Diseases Prevention Acts were consolidated and amended, and when the Metropolis Local Management Act, which required the appointment of Medical Officers of Health and Inspectors of Nuisances in London, was passed. Under that Act those officers were appointed by the Sanitary Authorities in London, and under that Act I am proud to say that I have been a Medical Officer of Health for nearly twenty-nine years.

From 1855 to the present time, medical officers of health and inspectors of nuisances, now more properly called sanitary inspectors, have been at work all over London searching out the causes of diseases and preventing them, abating nuisances of all kinds, and educating the public, with a result which I will explain later.

In 1866 the Sanitary Act was passed, but although some good was done by it, it did not provide for the appointment of medical officers of health and sanitary inspectors throughout the country. This defect was remedied by the Public Health Act of 1875, which required local authorities all over the country to appoint such officers.

The effect of this has been most beneficial, and I will refer to it later on, and also to the effect which has been produced in the health of London by the carrying out of the Public Health (London) Act, 1891.

It was in consequence of the Public Health Act of 1875, that The Sanitary Institute was founded in 1876, and one of its first acts was to originate an examination for persons who wished to become Sanitary Inspectors. These examinations it has continued ever since, and in doing so has performed a great work for many years, and one which alone would entitle it to the gratitude of all who are interested in sanitary work! And who are not? for "*Salus populi suprema lex.*" From 1877 to 1889 no les sthan 5,401 candidates were examined, and 3,073 of them obtained certificates.

The Parkes Museum of Hygiene was also founded in 1876, in memory of Professor Edmund Parkes, the great English hygienist, and was incorporated with the Sanitary Institute in 1888; these two Societies had been working together for five years previously, but since that date have been one institution, the Parkes Museum having become in fact the museum of the Sanitary Institute. Our Patron is H.R.H. The Duchess of Albany; the past Presidents of the Parkes Museum and of The Sanitary Institute have been H.R.H. Duke of Albany, the Duke of Northumberland, and the Duke of Westminster; and our present President is H.R.H. Duke of Cambridge.

Besides the examinations for Sanitary Inspectors, which are now carried out by a conjoint board formed of representatives of various sanitary societies in London, the Sanitary Institute also originated examinations in practical sanitary science and examinations for inspectors of meat. It has also instituted a system of training for these various officers consisting of lectures of which forty-eight were delivered last year, with a total attendance of 2304 students, and practical demonstrations for sanitary officers and meat inspectors. No less than ninety-seven classes, with a total of 2154 students, were brought to the Museum last year, while the number of other persons visiting the Museum is estimated at 7,500. These examinations are not only held in London, but at various provincial centres, and the Council has recently arranged for an examination to be held in Sydney, N.S.W., and negotiations are in progress for another to be held in Canada.

It would occupy your time too much for me to explain the work that has been done by the Sanitary Institute more in detail. Suffice it to say that in addition to the training and examination of inspectors and others, the interest of the public in hygiene has been aroused by annual congresses held in various cities and towns in the United Kingdom, and by meetings held in London for the discussion of important sanitary matters.

This leads me to add that at the invitation of the Sanitary Institute, in which invitation the Society of Medical Officers of Health joined, the International Congress of Hygiene and Demography was held in London in 1891. That as recently as last week the Institute held a conference in London on the housing of the working classes, a subject of the highest importance to all large communities, and that next year a very important congress on the question of the prevention of Tuberculosis is to be held in London.

The total number of members of the Institute has increased from about 530 in 1888 to 2324 in 1899. Among these there is a class of Honorary Fellows, men of the highest distinction in sanitary work in all countries. There are now thirty-five Fellows in this class, and I have the greatest pleasure in informing you that Professor Gréhant has been duly proposed as an Honorary Fellow.

The good that has been done by the various agencies I have mentioned is seen in the marked diminution of the general death-rates in the latter half of this century, not only in London but also throughout England and Wales. Thus for instance as shown in Table I, the death-rate in London from 1851 to 1870 averaged 24·1 per thousand, from 1871 to 1890 it had gone down to 22·5, from 1891 to 1895 it averaged 22·2, and from 1896 to 1899 it actually went down to an average of 18·8.

I may be allowed here to refer for a moment more particularly to the district of London for which I have been medical officer of health for twenty-eight years. This is in the west-end of London and has a population of rather more than 80,000. The death-rate of this district during the last four years has averaged only 13·67, or if corrected for age and sex distribution only 15·13 per thousand per annum. This I take it is a very remarkable result for a population of over 80,000 persons in the middle of a city which, including the near suburbs (Greater London), has a population of over six and a half millions.

TABLE I.—LONDON.

Years.	Average death-rate per 1000 per annum.
1851 to 1870	24·1
Nuisances Removal Act, 1855.	
Sanitary Act, 1866.	
1870 to 1890	22·5
Public Health (London) Act, 1891.	
1891 to 1895	20·2
1896 „ 1899	18·8

TABLE II.—ENGLAND AND WALES.

Years.	Average death-rate per 1000 per annum.
1849 to 1875	22·4
Public Health Act passed in 1875.	
1876 to 1880	20·8
1881 „ 1885	19·4
1886 „ 1890	18·9
1891 „ 1895	18·7
1896 „ 1898	17·4

In England and Wales the death-rate for some years before 1875, when the Public Health Act was passed, was 22 per 1000. It has gradually gone down until from 1896 to 1898 it was only 17·4 per 1000 (see Table II.).

The Registrar-General calculates that the total saving of life in the decade 1881–90 over that of 1871–80 is equal to 2,192 lives annually per 1,000,000 of the English population, and of course the life saving in 1881–90 over that of 1861–70 is far greater still.

But I must now refer to a special Act which has been productive of the most beneficial results. I refer to the Act for the Notification of Infectious Diseases, passed in 1889. For some years before the passing of this Act the notification of certain infectious diseases had been compulsory in some towns, and in 1883 I prepared, at the request of the Council of the Sanitary Institute, a report on the working of the Local Acts in those towns. The result of my investigations convinced me that the compulsory notification of infectious diseases "is a very important sanitary measure and a great boon to the community to whom it has been applied," and the successful results obtained in the towns which had adopted such a measure brought about the passing of the general Act in 1889.

This Act extended to every sanitary district in London, and to any Urban, Rural, or Port Sanitary District which chose to adopt it. At first there was some opposition on behalf of a portion of the medical profession, who held the view that it would be a breach of professional confidence for them to certify to the public authority the fact that their patients were suffering from infectious disease, and it was no doubt to a great extent owing to this opposition that the system of dual notification under which not only is "every medical practitioner attending on or called in to visit the patient" compelled under penalties to certify the fact of infectious illness to the medical officer of health, but also the head of the family is required to notify it.

I have always been opposed to dual notification, and have maintained that all that was necessary was that the medical man should certify the fact of infectious illness to the medical officer of health, and the working of the Act has shown that such is the case.

As a matter of fact, none of the disadvantages which were foretold have been experienced. The Act works perfectly smoothly, medical men loyally carry it out, and the difficulty which it was anticipated would arise between them and their patients has proved to be a myth. At the same time the futility of dual notification has been made manifest by the fact that the sub-section of the Act requiring householders to notify the fact of infectious disease in their houses to the medical officer of health is to all intents and purposes a dead letter.

This Act has, I am satisfied, been productive of great benefit and assisted materially in the great diminution of the death-rate from certain of the infectious diseases in England and Wales. Thus on glancing at Table III. we see that the death-rate from Scarlet Fever, which was reduced by general sanitary measures from 972 per million persons living in 1861–70, to 716 in 1871–80, was still further reduced to 334 in 1881–90, to 182 in 1891–

95, and to 146 in 1896–98, and that the numbers for continued fevers (chiefly Enteric Fever) were 885, 482, 235, 185 and 174 per annum during the same periods. With such results it is not to be wondered at that the whole country has now been put under the operation of the Act. I have put in the same table the notable reductions that have taken place from general sanitary improvements in diarrhœa and Phthisis, although neither of these are notifiable diseases. (The increased average death-rate from diarrhœa in 1890–98 was due to the excessive heat during the summer of 1897 and 1898.) It will be noticed that the greatest reduction of all has taken place in continued fevers (chiefly Enteric) where the death-rate has been reduced to less than a fifth of what it was in 1861-70 (a most remarkable result), and this is to be expected, as the influence of sanitary improvements can be brought to bear upon them, perhaps, more directly than upon any other disease.

TABLE III.—ENGLAND AND WALES.

Annual Death-rates per million persons living.

	1861-70.	1871-80.	1881-90.	1891-95.	1896-98.
Scarlet Fever ...	972	716	334	182	146
Continued Fevers (chiefly Enteric)	885	482	235	185	174
Diarrhœa ...	1076	935	674	630	769
Phthisis	2475	2116	1724	1464	1321

M. A. JOLTRAIN, General Secretary of the French Society of Hygiene, congratulated Prof. Corfield on his interesting address. The figures which he had given as to the regular decrease of mortality in London were evidently interesting; but what struck him most in the statistics was the decrease of deaths from phthisis. For many years past hygienists had recognised that tuberculosis had made most distressing progress in all European countries, and a campaign had been entered upon to try and arrest the march of this fatal disease. Now Prof. Corfield had just shown that the decrease of mortality from phthisis had been from 2,475 to 1,321 during the last forty years. It seemed then that Great Britain furnished the only exception to the general rule. The popularising and the rigorous application of hygienic principles had evidently contributed to these happy results, but in other countries of Europe the principles were popularised and also rigorously applied, and still the ravages of tuberculosis grew greater.

M. Joltrain therefore asked Prof. Corfield to what other causes he could attribute this remarkable exception in favour of Great Britain.

Prof. Corfield replied that, in his opinion, the great decrease in the mortality from phthisis was due to many causes: 1, notably to the lowering of the subsoil waters in towns caused by drainage operations; 2, to the clearing of unhealthy areas by the demolition of old insanitary houses; 3, to the prevention of overcrowding; 4, to the construction of new houses with improved sanitary arrangements, and to the widening of streets.

After this important communication, M. le Prof. Gréhant showed a series of portraits of the savants of the century.

The last portrait, that of Dr. Pietra Santa, founder of the French Society of Hygiene, was received with applause, and all present rendered homage to the memory of him who was in France one of the first to popularise the science of hygiene.

The members of the Congress then adjourned to the amphitheatre of comparative anatomy, where M. le Prof. Gréhant, assisted by M. Nicloux, showed an interesting series of experiments on the estimation of alcohol, and of carbon monoxide in the blood, and of fire-damp in mines. This was the first of the great discoveries made during the last few years by the eminent Professor of the Museum and his distinguished colleague.

M. Nicloux showed in a satisfactory manner that, according to recent observations founded on the researches of his master, it was established as an absolute certainty that all the alcohol imbibed by the mother was found in her milk and in the blood of the fœtus.

M. Gréhant explained in a few words how, after patient research and numerous experiments made in his physiological laboratory at the Museum, he had been able, with Felix Le Blanc and Claude Bernard, to make good progress in toxicology in measuring the quantity of carbon monoxide that was found in the blood of an animal which had breathed a mixture of air and this very poisonous gas from a proportion of 1 in 1000 to 1 in 10,000.

He showed also the marvellous success he had attained in bringing to perfection the grisoumètre of Coquillion, thanks to the exactness and sensitiveness of which there could be discovered in an atmosphere containing only $\frac{1}{100}$ part of fire-damp a variation of $\frac{1}{1000}$ part of this gas by a record equal to one division.

CONFERENCE OF MEDICAL OFFICERS OF HEALTH.

ADDRESS BY

A. WYNTER BLYTH.

(FELLOW.)

ON

"International Sanitary Regulations with regard to the Control of Infectious Diseases."

INTERNATIONAL Sanitary Regulations as determined by successive conferences only exist as to certain definite infectious diseases, such as cholera. The first of these International conferences took place in Paris in 1852, a second at Constantinople in 1866, a third at Vienna in 1874, a fourth at Rome in 1885, a fifth at Venice in 1892, a sixth at Dresden in 1893, and a seventh at Paris in 1894.

The International Sanitary Regulations at present in force are based upon the 1894 Paris conference, and the 1893 Dresden conference. The conference at Paris dealt with the importation of cholera *from* the East *into* Europe, the Dresden conference dealt with precautions when cholera had actually invaded Europe. In other words, the Paris conference was an Oriental, the Dresden a European conference.

It is particularly to be noted that each successive conference has tended to assimilate the precautionary measures to those suggested by English experience; in other words, the vexatious and useless ceremonies of quarantine are gradually being dispensed with, and a system of medical inspection and the practical application of the principles of hygiene substituted.

QUARANTINE.

Quarantine appeals strongly to the lay mind; in fact to all those who have not studied the history and the practical effects of quarantine. Experience has amply proved that quarantining healthy persons because they have actually been in contact with infection, or supposed to have been, is unnecessary, and on a large scale becomes impracticable. Draw a cordon ever so tightly, it will not resist ingenuity or gold. The expense of housing in lazarets a number of persons and above all the dislocation of commerce, alike forbid quarantine. For example, when cholera was epidemic in Hamburgh, to quarantine all suspected vessels and to house their passengers in suitable places, would have cost each English Port Sanitary Authority enormous sums; and the results, so far from keeping cholera away, would have been no better than those which were obtained by the system of medical inspection. Quarantine was a simpler matter in the early part of this century than it is now. The development of oceanic and land transit has acquired such enormous proportions that while on the one hand it has given facilities for pandemic spread of infection, on the other the very vastness of the traffic between east and west, north and south, has made systems of prevention based on quarantine impossible.

THE EXTENSION OF INTERNATIONAL SANITARY REGULATIONS.

It is this linking together of the whole world by railway and ocean steamer that suggests to the speaker the absolute necessity in the interests of all countries to come to some common agreement as to the prevention of the propagation of infectious diseases along the lines of international intercourse. I use the term "infectious diseases" because I do not think the regulations should be confined, as they have hitherto been, to cholera, plague, and yellow fever, but to such maladies as small-pox, epidemic cerebro-spinal meningitis, diphtheria, typhus, enteric, and scarlet fevers.

WHAT EXTENSION OF EXISTING INTERNATIONAL MEASURES OF PREVENTION ARE POSSIBLE.

These may be discussed under two heads, viz.:

1. Information.
2. Repressive measures.

Some method of reciprocity as regards information might in time be arranged. Not every country possesses like England a system of notification; all civilised nations have, however, a system of registration of the causes of death, and week by week an interchange of statistics as to the number and causes of deaths between the various countries in Europe, America, and our own ought to be attainable. The Dresden Conference discussed this matter with regard to cholera, but the understanding ultimately arrived at was of little practical utility.

REPRESSIVE MEASURES.

The first principle with regard to repression is that no person actually ill of any serious infectious malady should be allowed to travel by land or sea save under medical sanction. All persons actually ill should be compelled to provide themselves with a medical certificate stating either the exact nature of their illness, or at all events that they were or were not suffering from the infectious diseases already enumerated.. The result of this regulation would be that either the various railway companies or masters and owners of vessels would absolutely refuse to convey certain sick suffering from infectious maladies, or if they were conveyed they would be conveyed with due precautions, and due notice to the authorities of the district to which the sick was travelling. Had such a regulation been in force, it would not have been possible for the recent incident to have occurred, viz., a man actually ill of malignant small-pox to have travelled all the way from Russia, and to have introduced in transit small-pox into at least three large English towns. There is evidence to show that this particular case was obviously ill; but there are many cases of infectious illness, such as the ambulatory cases of cholera, of plague, of diphtheria, of scarlet fever and even of typhus, where the person may appear to a casual observer fairly well. No regulations can touch such cases. Human society must run the risk of them; but I maintain that it is the interest of every civilised form of government to supervise the movement of the actual infectious sick. I do not say for a moment that they should necessarily be stopped from travelling; there are indeed many cases where it might be advantageous to move them from large centres of population to small centres, but if they travel it should be under proper sanction and control. As to the details of sanction and control, such matters belong to the domain of the local and, so to speak, domestic government of the particular country.

The advantages of such control over the movements of possible foci of perambulatory infection are enormous and obvious: absolute free movement to the healthy or apparently healthy, absolute free movement to merchandise, but restraint on movements of persons ill of any dangerous infectious disorder. Surely no civilised power can take exception to such a moderate common sense demand.

CHOLERA.

I now pass to a consideration of certain special maladies, the more especially cholera, plague, and yellow fever, diseases to which the Governments of Europe have always given much attention. In India and the far East there are several places in which cholera is practically always present, but the danger to Europe is the great annual pilgrimage to Mecca. Since the opening of the Suez Canal and the replacement of steamers for sailing vessels, this pilgrimage has entered upon an altogether new phase, and has been regulated by rules under the general agreement of the Powers represented at the different conferences already mentioned.

To understand the difficulties of regulating the pilgrim traffic, the kind of persons who undertake the pilgrimage must be borne in mind. With a certain percentage of fairly clean and sensible Moslems there is always a large proportion of extremely dirty, ignorant, and fanatical Bengalis. These have been well described in the late Lady Burton's travels in Arabia, Egypt, and India, and a passage may be quoted: "The third order, which at first numbered 600 and odd, including 23 deaths, is composed of Bengalis, the very meanest specimens ever seen, equally contemptible in body and mind. They are distributed upon the fore and middle decks, and both holds have been cleared to receive them; the fare varying from Rs. 14—20. The women go about with unveiled faces and both sexes wear the scantiest of toilets, they seem to think only of muffling the head. Their food is a little rice and perhaps fish-like strips of sun-dried meat, which they have cut from the victims of Muna. All are half starved; many are so old that they can scarcely move, and not a few die with hoards of rupees in their waistbands, refusing to buy a meal or to engage a servant for a few annas. These miserables are indescribably filthy. Fresh from the pilgrimage they rob one another. Squatted like apes and crowded like herrings (men like mummies and women like the witches in Macbeth) they pass their time in chattering, in squabbling, and in calling for water, which is served out morning and evening and in the Caccia del Meditteraneo, with occasional attempts at praying and cooking. They are so ignorantly fanatic that if an infidel gives them a plate of rice and curry they will, even while starving, throw each mouthful out of the scupper hole, whilst pretending to swallow it; yet the sensible law of El Islam allows man to save life even by eating pig. If, at their request, you give them medicine they will heave it overboard, and if they die after eating it their caste fellows will declare that you have poisoned them to lighten the ship."

The extract quoted sufficiently indicates the class of persons and the immense difficulties which have to be solved. The regulations at present in force sanctioned by the last International Convention are much in advance, both from the point of humanity and hygiene, of those sanctioned by previous conventions.

They relate I., to matters of sanitary police in ports of departure of pilgrim vessels coming from the Indian Ocean and Oceana, and to measures on board; II., Sanitary supervision of pilgrimages in the Red Sea.

I. Pilgrim vessels from the Indian Ocean. In these every person taking a passage is inspected medically before embarking, and if found to be suffering from diarrhœa or cholera is not allowed to embark. Pilgrims are also required to prove that they have the necessary means for the journey, contaminated and suspected objects are to be disinfected.

In the event of cholera existing in the port, passengers are not allowed to embark until they have been under surveillance five days.

The steamers are measured and inspected unless the captain is provided with adequate evidence on this point, furnished by the competent authority of his country. There are various provisions dealing with the cleanliness of the vessel, the fuel, the water and food supply. The deck and between decks must be of wood, not iron. There must be a doctor on board. There must be closets for the use of the crew, and in addition, passenger closets in the proportion of at least one for every hundred persons. Each pilgrim is to be allowed 5 litres of drinking water. In a case of sickness there are fairly adequate provisions for medicines, disinfection, and so forth. Penalties are provided for any breach of the regulations.

II. Sanitary supervision of pilgrimages in the Red Sea. These vary according as to whether the vessel is healthy, suspect, or infected. In every case the pilgrim vessel touches at the sanitary station at Camaran.

(*a*) *Healthy Vessels.*—The pilgrims are all compelled to land at Camaran, they take a bath, soiled linen or suspected articles are disinfected, and after a detention of forty-eight hours, no suspicious case having occurred, the pilgrims are re-embarked, and the vessel continues the voyage.

(*b*) *Suspected Vessels.*—"Suspected vessels" are those which have had cases of cholera at the time of departure but no cases within seven days. The pilgrims are treated exactly as in the first case, and after forty-eight hours' detention, provided no illness occurs, the vessel is allowed to continue her voyage.

(*c*) *Infected Vessels.*—An infected vessel is one which has cases of cholera or choleraic diarrhœa on board, or such cases have occurred within seven days from the port of departure. The cholera cases are isolated in hospital; disinfection is thoroughly carried out. The amount and extent of disinfection is in the discretion of the local authority.

The Convention also provides for considerable improvements in the Sanitary Station at Camaran. The most important of these improvements are:—

The provision of separate and complete isolated hospitals for the two sexes (*a*) for the observation of suspected cases; (*b*) for cholera patients; (*c*) for sick persons affected by other contagious diseases; (*d*) for ordinary illnesses.

The camps are to be separated in an efficacious manner from each other and the distance between them to be as great as possible.

The dwellings destined for pilgrims are to be constructed on the best hygienic principles and not to contain more than twenty-five persons each.

There are also provisions as to suitable disinfecting appliances, distilling machines, apparatus for the sterilisation of water by heat, machines for making ice as well as suitable appliances for the storage of water.

Similar improvements are to be carried out at the Sanitary Stations at Abou-Saad, Vasta, Abou-Ali, as well as at Jeddah and at Yambo.

The superintendence and execution of the measures with respect to pilgrimages are confided, as far as the Superior Council of Health at Constantinople has jurisdiction, to a Committee chosen from that Council. This Committee is composed of three of the representatives of Turkey on the Council, and of representatives of the Powers who have acceded to the Sanitary Conventions. The President is to be one of the Ottoman members.

It must be conceded that, providing the spirit of these various regulations be carried out, the diffusion of cholera from the Mecca pilgrimage will in future be reduced to small dimensions. The details it is true call for still further improvements, for example: the water-closet accommodation on board pilgrim vessels is still quite inadequate. One closet for every 100 persons means that, allowing five minutes' use of a closet for each person, it is possible for over eight hours to elapse before a particular individual, whatever his necessity, could use it. The practical outcome, especially in bad weather, must be fouling of utensils and decks and possible food contamination to a dangerous degree. The allowance between decks of a space of 114 c. ft. per head, considering the character of the passengers, is also inadequate. The detention for five days of suspected vessels with improved hygienic arrangements is probably an unnecessarily long period, and lastly, the composition of the executive body, with its diverse nationalities and interests, is such as leaves much to be desired.

THE DRESDEN CONFERENCE.

The Dresden Conference consisted of delegates from Germany, Austria-Hungary, Belgium, Denmark, Spain, France, Great Britain, Italy, Luxemburgh, Montenegro, the Netherlands, Portugal, Roumania, Russia, Servia, Sweden & Norway, Switzerland and Turkey. The main object of this Conference, as already stated, was to adopt regulations when Europe was invaded by cholera.

A system of notification of cholera between the different countries was arranged. Unfortunately the system is so defective that it is useless, the notification being limited to a so-called "foyer," and as there is no definition of a "foyer," it may be taken that under the Dresden convention there is no obligation for the various countries to notify isolated cases—the very cases which from an English point of view are important.

No district is to be considered "infected" until it is held to be the seat of a "foyer" of cholera; five days after the death of a case of cholera, no cases having occurred in the interim, the district then ceases to be infected, and all restrictions are to cease as regards countries which do not export "susceptible" articles. Susceptible articles are bedding and clothing which have been in use and "rags," but rags in bulk, clean clippings and shoddy do not come under the definition of "rags." The susceptible articles, if they are so packed as not to admit of being handled, may also pass through. If merchandise has been exported from an infected country five days before the infection appeared it is exempt from restriction.

The maritime regulations are similar to those already detailed, that is to say, there are three classes of vessels: those (*a*) with an absolutely clean bill of health; (*b*) suspected; and (*c*) infected vessels. With regard to infected vessels, the persons actually sick are to be landed and treated in hospital; the healthy passengers are to be detained under observation for five days; all things that are thought to be actually contaminated by choleraic discharges or infection are to be rigorously disinfected. In short, with the exception of the five days quarantine of the healthy passengers, the views of the English delegate, the late Sir Richard Thorne Thorne, were adopted. Suspected vessels are merely subjected to a medical visit, to certain operations as to disinfection, and to a few minor precautions.

The Convention also agreed that every country should provide on each of its coasts at least one port so fitted and adapted as to be able to receive vessels, whatever their sanitary condition.

The Convention also laid down certain conditions as to navigation in the Sulina mouth of the Danube, the following being a summary of the more important. All ships arriving from infected ports reaching the mouth of the Danube are to be medically inspected daily for three days. All infected linen to be disinfected and certain precautions to be taken with regard to the bilge and drinking water. Further, these and other allied precautions are to be carried out and eventually repeated according to the state of health on board at sanitary stations to be established up the river; while all vessels ascending the Danube from Sulina must comply with certain general regulations, such as the avoidance of overcrowding and similar matters laid down with the object of maintaining a high state of health on board.

PLAGUE.

The English method of medical inspection at the port of arrival, and prompt isolation of persons affected, and the giving of information to sanitary officials throughout the country of the presumed destination of the apparently healthy passengers and crew, has been found sufficient hitherto for practical purposes. We can point to cases having actually arrived in our ports without extension.

There is no reason to believe that other countries would be less successful, always provided that they improve their standard of sanitary administration up to that of the English standard. Recent advances in our knowledge of plague and its methods of diffusion have clearly shown that it is propagated mainly by ambulatory cases and by rodents, rather than by merchandise. The slighter cases of plague can be detected by efficient medical inspection, and with regard to the importation of the malady by rats from shipping, it ought not to be an insuperable problem to destroy all rats on board a vessel before the vessel actually enters docks or discharges cargo. The structure of steamers and vessels being such that they can be converted into practically air-tight boxes, renders it possible by suitable engineering appliances to fill the vessel with carbon monoxide, and dioxide, in other words to convert it into a lethal chamber, and then subsequently displace the gas by fresh air, the same fans or pumps being equally available. It does not seem necessary to disinfect the cargo of a vessel coming from a port infected with plague, provided it can be shown that either the vessel is destitute of rats, or that the rats be destroyed, or unless there are special circumstances involving special suspicion of such cargo.

YELLOW FEVER.

It is interesting to note that the only remnant of legislation in England, with regard to quarantine, still existing on the

Statute Book, was specially framed against yellow fever (The Quarantine Act 6, George IV.).

Yellow Fever does not readily spread in Northern latitudes. The outbreak in Swansea in 1865 however, shows clearly that in our own country, under certain conditions, it may spread to an alarming extent. This outbreak is the more particularly interesting because it would not be difficult for the supporters of quarantine to cite this outbreak as an argument for the revival of the older regulations. In 1865 during July, August, and September the heat in England was tropical. The Hecla, a wooden sailing vessel, left Cuba on July 26th laden with copper ore for Swansea with cases of yellow fever on board, it had successive new cases till towards the end of August, and entered Swansea harbour on the 9th of September with one of her seamen dying and two others convalescent from the fever. She was immediately moored alongside a wharf; on the same day the facts leaked out, the authorities became alarmed and the ship was subjected to a cleansing and disinfecting; even so late, however, as the 11th the scupper holes were seen to be filled with excreta, and it was not until that date that the cleansing and purifying of the vessel was completed. The Hecla remained at the wharf until the 28th and was then removed from the dock.

"On September 15th, six days after her arrival, to October 4th, six days after her removal, Swansea witnessed the entirely new phenemenon of yellow fever attacking in succession some twenty inhabitants of the town, besides others who suffered less definitely or more mildly, and this not indiscriminately over the whole large area of Swansea, but only in definite local relation to the ship, while at Llanelly there also fell sick in the same way three of the crew of a small vessel which had been lying for two days alongside the Hecla at Swansea.* "

The arrival of the Hecla without flying the quarantine flag or giving any indication of sickness on board was, of course, an illegal act, but all the evidence points to the fact that the disease was spread by the vessel herself, and not by the crew and passengers; so that had they been allowed to land and the sick been isolated in hospital, and the ship not permitted to discharge her cargo until after a most thorough cleansing, aëration, and disinfection—as would have been the case probably with our present practice—the disease would not have extended to the town. Hence this case cannot be quoted as supporting quarantine in the sense that continental nations understand quarantine, that is, placing the healthy as well as the sick in a place of detention, and drawing a strict cordon around ship, crew, passengers, and cargo.

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* Report of Medical Officer to the Privy Council, 1865.

If a majority of the Conference are in accord with the principles laid down in this contribution, I venture to propose for discussion and adoption the following resolutions:—

That in the opinion of this Conference success in the international control of the diffusion of infection from country to country is likely to result from an organised system of medical inspection and of reciprocal information, and the isolation of travellers found to be actually suffering from infectious disease.

That the Conference suggest the advisability of the Council of The Sanitary Institute approaching Her Majesty's Government, suggesting that the Government convene a sanitary conference, composed of delegates from all civilised governments throughout the world, with a view of ascertaining how far general rules could be adopted as to the control by land and sea of the diffusion by travel and commerce of all the more important infectious maladies.

Prof. **Corfield** proposed that a hearty vote of thanks should be accorded to Mr. Wynter Blyth for his address. The greatest difficulty they were confronted with in dealing with small-pox arose from the fact that young medical men were now unable to recognise the symptoms, so rare had the disease happily become in the practice of the general practitioner. It was not an uncommon thing for chicken-pox, which was a comparatively harmless disease, to be taken for small-pox. On the other hand, he knew of a case in which death occurred from what was supposed to be, and what was certified to be measles, but eventually it was found to be a case of hæmorrhagic small-pox. Prof. Corfield cited the case of a medical man who had a pain in his back and thought he had lumbago; he also had some pimples which he took for acne. After the disease had been communicated to his wife and several other people, it was discovered that the doctor was suffering not from lumbago and acne, but from small-pox. In regard to quarantine he had noted a great change in the public opinion in Europe. He attended the meeting of the International Congress of Hygiene and Demography held at the Hague in 1884, and when he rose to explain why England had abandoned quarantine for ever he was not allowed a hearing. At the next Congress, the one at Vienna in 1887, the subject of quarantine again came up, and Professor Pettenkofer then stated that England had spent millions on sanitary works, that she was no longer afraid of cholera, and that the other European nations had only to follow her example in order to get rid of the necessity for quarantine, while at the Congress in London in 1891 there was a general consensus of opinion in favour of the English views on the subject.

Dr. P. **Boobbyer** (Nottingham) in seconding the proposal said we should not be deterred from further efforts to promote international reciprocity in regard to notification of infectious sickness by their apparently transcendental nature. Many of our greatest and most useful reforms had been condemned at the outset as revolutionary. Mr. Bright foretold the utter failure of the Sale of Food and Drugs Acts, because Englishmen, he said, would never consent to their tyrannous provisions. These Acts, the speaker said, had proved a conspicuous success. All nations were interested in preventing the diffusion of dangerous infectious sickness among their neighbours; they would be indirectly protecting themselves as well as their neighbours by so doing. He gave an account of two foreign outbreaks of small-pox in 1894, caused by the exportation of infected lace from Nottingham, in that year. He was in possession of information, he said, which would have enabled him to warn the authorities of the infected places before the lace was landed had he been at liberty to do so, but he was not.

Dr. S. **Rideal** (London) referred to one of the cases mentioned by Prof. Corfield in which the small-pox originally described as malignant measles was introduced into a lodging house inhabited by an omnibus conductor, so that the inefficient diagnosis might have caused a spread of the disease in the same way as Dr. Boobbyer found it with the Nottingham lace. He doubted whether carbon monoxide or carbonic acid gas would effectually rid ship-holds from rodents. What was wanted was not a means of poisoning them, but of driving them out of the ship into traps and then cremating them. This ought to be possible by fumigation with a pungent gas; sulphurous acid, he believed, did this, but could not be used with certain cargoes. Formaldehyde had not been tried so far as he knew, but it would have no permanent effect upon the cargo, and he thought that rats would run away from this gas if it were driven through the ship.

Mr. J. M. **Martin** (Stroud) made a few remarks with regard to pilgrim traffic in the east, including the difficulties of examining sick pilgrims to determine if they were suffering from infectious diseases.

Dr. J. R. **Kaye** (Wakefield) said he had the good fortune, as far as maritime quarantine was concerned, to live in an inland county, and they had such faith in the ability of the Port Sanitary Authorities, that they rested in comparative calmness and confidence. He fully endorsed all that had been so ably said by the President. The value of reciprocal information and notification was undoubted. Many instances could be given in illustration of this. Recently in twenty-four importations of small-pox into the West Riding, thanks to notification and the activity of the sanitary authorities, there was only a second case in one instance. The speaker said he would advocate with the President the compulsory provision of a medical certificate by sick persons about to travel from one country to another. He fully concurred with the opinion that medical inspection, reciprocal information, and isolation were preferable to quarantine.

M. **Joltrain**. Secretary-General of the Société Française d'Hygiène, who spoke in French, stated that the "Journal d'Hygiène" had always sustained an energetic campaign in favour of the suppression of quarantine. Its regretted founder and editor, Dr. de Pietra Santa, had been inspired by English ideas, and was very strongly opposed by the French official hygienists. He had contended that rigorous quarantine had never given any practical results in the suppression of epidemics that were commensurate with the interference that it caused to commercial interests, and that there were other measures that could be taken for arresting the invasion of epidemic diseases. This idea, which was sustained by the "Journal d'Hygiène," had been the subject of animated discussions on many occasions, and the contentions of the editor, Dr. de Pietra Santa, were now producing the result of modifying the opinion of French hygienists. The time, however, had not yet come when they could receive in their entirety the ideas always held by the hygienists in Great Britain.

Mr. **Cecil Nicholson** (Paris) seconded the first resolution proposed by Mr. Wynter Blyth, which was carried.

Dr. J. R. **Kaye** seconded the second resolution proposed by Mr. Wynter Blyth, which was carried.

CONFERENCE OF ENGINEERS AND SURVEYORS TO COUNTY AND OTHER SANITARY AUTHORITIES.

ADDRESS BY

THOMAS DE COURCY MEADE, M.Inst.C.E., M.I.M.E., F.G.S., &c.,
(Fellow)
President of the Conference.

My first duty is to thank the Council of the Sanitary Institute for the honour they have done me in inviting me to preside over this Conference of Municipal Engineers. I feel assured that we shall take back to England very pleasant reminiscences of our visit to Paris, our only regret being that our time in France is of so short duration.

We meet here to-day for the general interchange of views upon subjects to which many of us have had to give close consideration. I hope therefore, in the discussion that may follow, speakers will as far as possible let us have the benefit of their practical experience, and the particulars of any results they have obtained by investigation.

The Prevention of River Pollution and the Purification of Sewage.

One of the chief difficulties municipal engineers have to contend with is that arising from the pollution of rivers and streams by sewage and manufacturers' trade refuse. How to prevent or at least to minimise the effects of such pollution at reasonable cost is a problem yet to be solved.

This question has been before municipal authorities in a more or less acute stage for upwards of thirty years, and during every decade within that period they have been many times assured by enthusiastic and zealous persons as well as by interested individuals in search of gain only, that a solution has been found and a road to complete success made easy. It would serve no good purpose and would occupy too much time to merely enumerate the heads of the many patented inventions and other processes that have been brought before the public with this object. I will refer very briefly to some of the efforts that have been made during recent years in the north of England to restore the rivers and streams to something approaching their original condition.

In no part of England is there a better field for the operations of the municipal engineer and chemist than in portions of Lancashire and Yorkshire, where many of the rivers and streams have long since been deprived of their natural degree of purity and have been in some cases until quite recently little better than open sewers. These rivers were the conduits for the removal of the crude sewage of a vast population. They were also freely utilised as scavengers for conducting away enormous quantities of refuse matter resulting from the great industries for which those counties are so justly celebrated. The rivers were employed not only for the removal of waste matters of every kind, but also in some instances, their waters from the source downwards were used and re-used many times over for trade purposes. Manufactories were erected beside, and indeed occasionally over, the rivers with the object of readily abstracting and utilising the water which was empounded by weirs placed across the rivers. In addition to all this pollution it was the general practice to tip waste solid matter into the rivers or to deposit it in convenient positions on the banks so that it might be washed away in times of flood.

The task of purifying the rivers under such conditions is one of great difficulty and involves a large capital outlay and a big annual expenditure, and even then purification can of course be effected in degree only. No thoughtful person who has considered the subject can suppose that it is practicable by any artificial means or by regulations, however well applied or skilfully administered, to restore the rivers to a condition of purity at all approaching their natural state whilst their waters are utilised for manufacturing purposes and receive the liquids resulting from the sewage of the towns within the watershed.

The state of things above described continued in Lancashire and Yorkshire until after the passing of the Local Government (England and Wales) Act, 1888. Under the provisions of that Act (section 14, sub-section 3), joint committees were formed in the counties of Lancashire, Cheshire, and Yorkshire. The Mersey and Irwell Joint Committee control the district included within the watersheds of the rivers Mersey and Irwell above Warrington. The Ribble Joint Committee deal with the watershed of the Ribble. In Yorkshire the West Riding Committee exercise jurisdiction over the rivers in the West Riding of that county. I propose to-day to confine my remarks to the district of the first mentioned authority.

The Mersey and Irwell Joint Committee have the control of an area of 482,195 acres, with a population of upwards of 2¼ millions, and a rateable value of over 10 millions sterling. It includes the rivers Mersey, Irwell, Medlock, Irk, and Roach, all of which discharge their waters into the Manchester Ship Canal.

Within this area there are between 400 and 500 manufactories. The industries carried on are various, and comprise calico printing, dyeing and bleaching, paper-making and staining, tanning, leather dressing, woollen and silk manufacture, chemical and soap works, brewing, fellmongering, &c., &c.

No record of the quantity of manufacturers' refuse passed into the rivers which feed the Ship Canal is available. In some instances, either under special agreement or otherwise, the manufacturers have obtained the privilege of discharging the liquid refuse of their works into the sewerage systems of the towns, and in such cases it is treated by the local authorities.

Many of the manufacturers whose works are situated in populous neighbourhoods have but little land upon which to lay down plant for purification purposes, and as the law requires them to adopt the best practicable or reasonably available means of preventing pollution, it is desirable that, where circumstances admit, they be permitted to discharge their refuse effluent into a sewerage system, in order that it may be properly dealt with by the Sanitary Authority, who should, however, have complete control over its admission to the sewers. The pickle from galvanizing works, for instance, might with advantage be allowed to enter the sewers in some cases if admitted in a relatively small and regular volume, and this would under certain conditions effect a saving in the chemical treatment at the outfall. If, however, it were discharged at irregular periods in large quantities, it might seriously interfere with the general treatment of the sewage. It is important that no waste matter which would injuriously affect the structure of the sewers or would throw down heavy deposits therein, be admitted into them until it has undergone sufficient treatment by the manufacturer, and the plant used for this purpose should be open to official inspection at any time of the day or night without notice. Manufacturers' refuse containing chemicals liable to generate explosive or other dangerous gases in the sewers, either separately or in combination with other chemicals, should be rigidly excluded.

Many of the manufacturers have no doubt benefited by the recent improvement in the condition of the water in the rivers. I am informed that the difficulties found in purifying trade refuse have led to a more careful examination of the waste matters and that a saving has in some industries been effected by utilising some matters that were previously allowed to pass away as worthless.

When manufactories are placed in open situations where land is available there are better opportunities of dealing with the waste liquids, and the owners of some large works so situated in Lancashire have expended considerable sums of money in purification plant and appliances. The methods generally adopted are precipitation followed by mechanical filtration.

The approximate quantity of sewage effluent from towns which passes into the rivers within the Mersey and Irwell watersheds, amounts to a normal flow of something like 68,000,000 gallons per twenty-four hours. Most of this sewage now undergoes treatment before admission into the rivers, and it represents about 52 per cent. of the minimum dry weather flow of the rivers.

The condition of the rivers within these watersheds has undoubtedly improved within the last few years, although statements have been publicly made to the contrary. The colouring matters contained in the liquids passing from dye works into the rivers give the latter an appearance of pollution, far in excess of what is actually taking place. The limit of impurity allowed in sewage effluent when passed into the rivers, or in other words, the standard of purity required by the Joint Committee is "one grain per gallon oxygen absorbed in four hours, albuminoid ammonia, ·1 grain per gallon." The laboratory tests applied are, for ammonia (free and saline) and albuminoids, oxygen absorbed three minutes and four hours test, and for chlorine. The published official tests of "bad" effluents do not give the amount of solids in suspension.

A series of experiments, extending over a considerable period, were conducted by Sir Henry Roscoe, assisted by Mr. Frank Scudder, F.I.C., at the Manchester Corporation Sewage Works, with the primary object of ascertaining the quantity of solids removed from the tank effluent by mechanical filtration. The quantity of dry solid matter removed was found to vary from 19½ lbs. to 57 lbs. per 100,000 tank gallons of effluent filtered. The quantity of solids removed varied also, as the following two analyses will show, viz.:—

ANALYSES OF SLUDGE DRIED AT 100 C. FROM THE WILSON FILTER.

		Percentage. No. 1.		Composition. No. 2.
Organic matter		38·0		45·8
Inorganic matter consisting of silica and gangue	12·9		7·3	
Oxide of iron and aluminia	35·5		23·2	
Calcium carbonate ...	13·6	62·0	23·7	54·2
		100·0		100·0

he above figures it will be seen that the tank effluent from 1·36 grains to 4 grains of suspended solids per e ratio of organic matter to inorganic matter being portion of about 2 to 3.

been a matter of remark that the quantity of solids ally intercepted and removed from the sewage and manufacturers' refuse before discharge into the rivers ade much reduction in the Ship Canal dredging. The of the water in the Canal has however improved.

terial now dredged from the non-tidal portion of the largely composed of matter eroded from the river the action of the water, together with that washed rivers from the surface of the ground in flood-time. erial will, of course, continue to be washed into the some of the towns, however, the river banks are with walls, and portions of the river beds have been inverted, with good results.

lowing statement* gives the actual quantities of sludge redged from the Canal during the last three years :—

Eastham to Latchford.	Latchford to Irlam.	Manchester Docks.	Total.
Cubic Yards.	Cubic Yards.	Cubic Yards.	Cubic Yards.
621,074	231,383	382,211	1,234,668
427,735	217,376	361,488	1,006,599
435,722	266,772	372,105	1.074,599

imated quantity of sludge now annually removed from e of the towns within the watershed is about 620,000 ds as against 638,877 cubic yards removed from the waters of the Ship Canal last year.

antity of sewage treated and proportion of solids o the Outfall Works is in most cases considerably y the rainfall. A proportion of the heaviest solids are deposited in the sewers during dry weather from which islodged and brought to the Outfall in time of storm. anchester Outfall as much as 300 tons of solids have sited in the precipitation tanks during one day's rain g a period of dry weather. These solids are largely of road grit, and other heavy matter, and are easily hed from the ordinary precipitated sludge, they lodge ks close to the inlets.

-The figures in this tabulated statement were kindly supplied to H. Hunter, Esq., M.I.C.E., the chief engineer to the Manchester

During the year 1897, which was the last year of sludge pressing at these works, 7·12 tons of cake were produced and 1·03 tons of heavy matter, which could not be pressed, was removed from the precipitating tanks by manual labour, per 1,000,000 gallons of sewage treated. The quantity of sludge obtained by chemical precipitation is influenced to a considerable extent by the proportion and kind of chemicals employed.

The works for the treatment of sewage by local authorities are being rapidly completed within the Mersey and Irwell watershed. The last published report of the Joint Committee shows that eleven only out of ninety-three urban and rural authorities are now without works in operation. Considerable difficulty is however found both by the local authorities and the manufacturers in complying at all times and under all conditions with the required standard of purity. The methods of purification generally adopted are those of chemical precipitation or sedimentation, and subsequent further purification by filtration, the filters being now generally worked intermittently as bacteria beds. There has not yet been sufficient time to obtain results other than experimental from extended operation of the improved system of purification under all the varying conditions now existing, most of the works having been only recently completed. At some of the works indeed the authorities are not at present filtering the sewage, but are removing the grosser impurities only, by precipitation.

The experimental filtration works at Manchester which were started with two experimental filters constructed by me in 1895, and worked for some time under the direction of Sir Henry Roscoe, were last year supplemented by three additional experimental filters, and a small septic tank installation. All these experimental filters have been since worked under the direction of the superintendent and chemist of the works, Mr. G. J. Fowler, F.I.C., whose reports thereon are published and show satisfactory results. As the question of the future treatment of the whole of the sewage of these works is now under consideration, I do not purpose to allude further to this part of the subject, but should be very pleased to hear the opinions of others upon the question of sewage purification generally.

The quantity of sewage treated by chemical precipitation at the Manchester Works during the year 1898 was 8,644,477,000 gallons at a cost of £8,338 2s. 10d. The average population contributing to the works during this period was 515,120, and the average daily quantity of sewage treated per head amounted to 46·08 gallons; the quantity of wet sludge produced amounted to 190,794 tons, of which 190,000 tons were deposited at sea, a distance of 60 miles from the works, at a

£4,725 5s. 8½d., and 794 tons were pressed into cake at ɔrks at a cost of £33 8s. 3d. A considerable amount of was formerly required for the removal of the heavy consisting of ashes, road drift, etc., which was brought ı times of storm, and deposited in the tanks as previously ed. This material during the past twelve months has ıshed forward by manual labour from the tanks into two ;, by which the sludge is forced through a rising main in diameter, and about ¾ of a mile in length, into l tanks at the Canal Wharf; it is gravitated from thence e sludge ship. The works for sludge disposal were d and constructed about three years since, and the ıtendent states in his annual report that "The working ejectors, sludge mains, and tanks has been uniformly tory, no case of blocking of the mains has occurred, h large quantities of heavy detritus have been mixed up ıe sludge, and sent through the mains to the steamer, ving much time and expense in the removal by hand: ks have been found capable of discharging their contents ity into the steamer in about 55 minutes." This being ıtes less than I had estimated previous to the construc- the works.

re the steamer was brought into use, the whole of the was pressed, and the cake was tipped on low land ıg, a proportion only being utilized for agricultural s. The work was as a rule carried on continuously. tual cost for the year 1897 was 7·7d. per ton of wet Previously the cost of pressing amounted to 3s. 6·4d. of cake produced, equal to 11·5d. per ton of wet I estimated that the cost of conveying sludge to sea mer would not exceed 8·9d. per ton; the actual cost year 1898 was only 5·9d. per ton.

ı the statistics I have obtained from 67 authorities in ershed, representing a total population of 2,238,000, the expended on intercepting sewer construction up to last .s £2,167,000, the amount expended on the purchase of r sewage treatment £459,000 and the amount expended ks for sewage treatment was £980,000, or a total of 000.

OPEN SPACES IN TOWNS.

ɔrovision of open spaces in towns is a subject that has d the minds of most sanitary reformers for many years [have endeavoured to obtain from some of the large ı England particulars as to the effect small open spaces on the health of residents in the immediate surroundings, especially in crowded districts, but beyond a general consensus of opinion in favour of the provision of these breathing areas, I regret that no reliable data are obtainable.

The satisfactory condition of the health of London is attributed in a large measure to the abundant supply of parks and other open spaces. The total number of parks, gardens, and open spaces in and around London is about 350 with a total area of over 18,800 acres. Many of these consist of small open spaces which have been acquired by the efforts of the Metropolitan Public Gardens Association. These spaces are distributed over the more thickly populated portions of the metropolis.

The Manchester Corporation have for many years endeavoured to increase as far as practicable the small open spaces in the thickly populated portions of the city. A considerable number of such areas are now in use, and are in many cases laid out as playgrounds for children, the larger areas being planted and maintained as public gardens. In Appendix A (p. 496), will be found a statement* showing the parks and open spaces at present under the control of the Manchester City Council, with their areas and general character, the cost of those purchased by the Corporation, and the valuation of those presented to the public. In some cases the population in the immediate neighbourhood is given. Much care and attention is bestowed upon the City parks and recreation grounds, and notwithstanding the near proximity of chemical and other works, a fair amount of foliage and vegetation is maintained by frequent renewals. A portion of the Corporation estates situated some five miles outside the City, also is utilized for Nursery purposes, an area of 65 acres being set apart for the propagation of trees, shrubs, and herbaceous plants. A number of trees are annually imported from these Nurseries in tubs for the purpose of decorating the squares and public buildings of the City.

Although as already stated it is difficult to obtain actual figures as to the effect of small open spaces upon the death-rate and general health of the surrounding population, there can be no doubt that they exercise a very beneficial effect and improve and brighten the conditions of life in thickly populated areas. A summary of the information obtained from the towns before referred to will be found in Appendix B (facing p. 492). The great price of property in the crowded portions of many old cities makes the acquisition of open spaces of large extent practically ossible, and if the value of small open spaces were e generally recognised much might be done in this ction, where larger schemes would fail. In many cases re property has become insanitary it might be purchased on onable terms, the site cleared of buildings and the surface elled, asphalted, or otherwise laid out as an open space, ts in some cases which are not thoroughfares might be rbed into the site with advantage; such a scheme would ove the dwellings immediately surrounding it, by the freer ssion of air, light, &c., and should therefore be looked upon favour by the owners of property in the neighbourhood.

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* This statement was kindly supplied to me by the Parks Superintendent, Mr. Robert Lamb.

PLANNING AND CONSTRUCTION OF STREETS.

e laying out of new streets for building purposes in the bs of large towns, the improving of the lines of frontages sting streets, and the formation of new thoroughfares by idening of existing streets and removal of buildings, are rs which demand much attention from all citizens who iterested in sanitary reform, and comprise some of the important duties which devolve upon the municipal eer. The manner in which these works are effected ses a very considerable influence upon the health of the unity. The model by-laws suggest a minimum width of for new streets, but the Local Government Board have oned by-laws which provide streets of 40 ft. and even in width. The minimum width that can legally be pro- is as a rule the maximum width that can be obtained he owners; 36 ft. is therefore too narrow. Wide streets ly improve a town, but help to make up for the small t of air space generally allowed at the rear of buildings. es where the buildings abut upon the street an extra of street might with advantage be provided. Trees in most English towns, and if the streets are wide enough of French planes or other hardy trees on each side of the eways adds much to the appearance of a town. Large f money are annually spent in widening and improving sting streets of English towns. Owing however to the alue of property the streets are seldom made of more fficient width to meet the present requirements of the Examples can be found in London and elsewhere of being widened twice within the memory of middle-aged . This of course is a great waste of money, as the lands sold after the first improvement have generally to rchased at greatly enhanced prices. With the likeli- largely extended street locomotion in the near future, all new streets both in the suburbs of towns and indeed in country districts also, should be laid out of a greater width than has hitherto been customary. Perhaps it is too much to hope that cyclists may within the present generation have proper cinder tracks provided at one or both sides of the main roads for their exclusive use and convenience.

I suggest for the purpose of promoting discussion that all new main thoroughfares leading to our principal towns should be of a width of 80 ft. This would admit of footways about 11 ft. 6 in. in width, margins of carriageways 18 ft. in width, and two lines of tramways, with a centre track for cyclists of 11 ft. If circumstances prohibited so great a width, then the statutory limit between the outer edge of the rail and the curb might suffice; this would reduce the width of the street to 63 ft. The tram-lines and cycling track might be asphalted, and the margin of the road paved, asphalted, or macadamised. Section facing p. 492.

SUBWAYS UNDER STREETS.

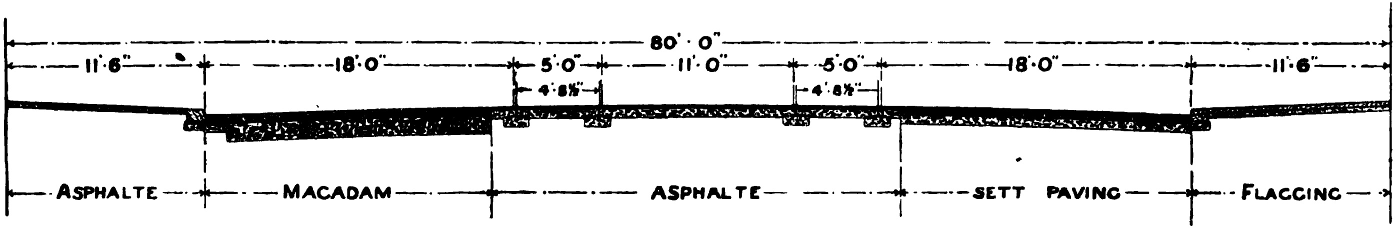
Few towns in England have adopted street subways, the principal exceptions being the City of London, the Metropolis, and the City of Nottingham.

The subways in the City of London were constructed at the time when the Holborn valley and other improvements were effected. The London County Council only form subways when making new streets that are likely to become important thoroughfares.

The cost is a very important item in the consideration of this question, and varies of course with the method of construction adopted, and the capacity of the subway.

The City of London subways are probably the most complete of their kind in England, but owing to the special circumstances caused by the variations of levels and intersected streets their construction was very extensive and costly. In these subways provision was made for future extensions of pipes and mains, &c., and for convenient access; there are ample means of lighting and ventilation, and I am informed that since these subways were constructed (about thirty years ago), there has been no occasion to break through the surface of the streets for the supply of gas, water, electricity, or other purposes. The experience of Nottingham with regard to the preservation of the street surfaces has been similar to that of London.

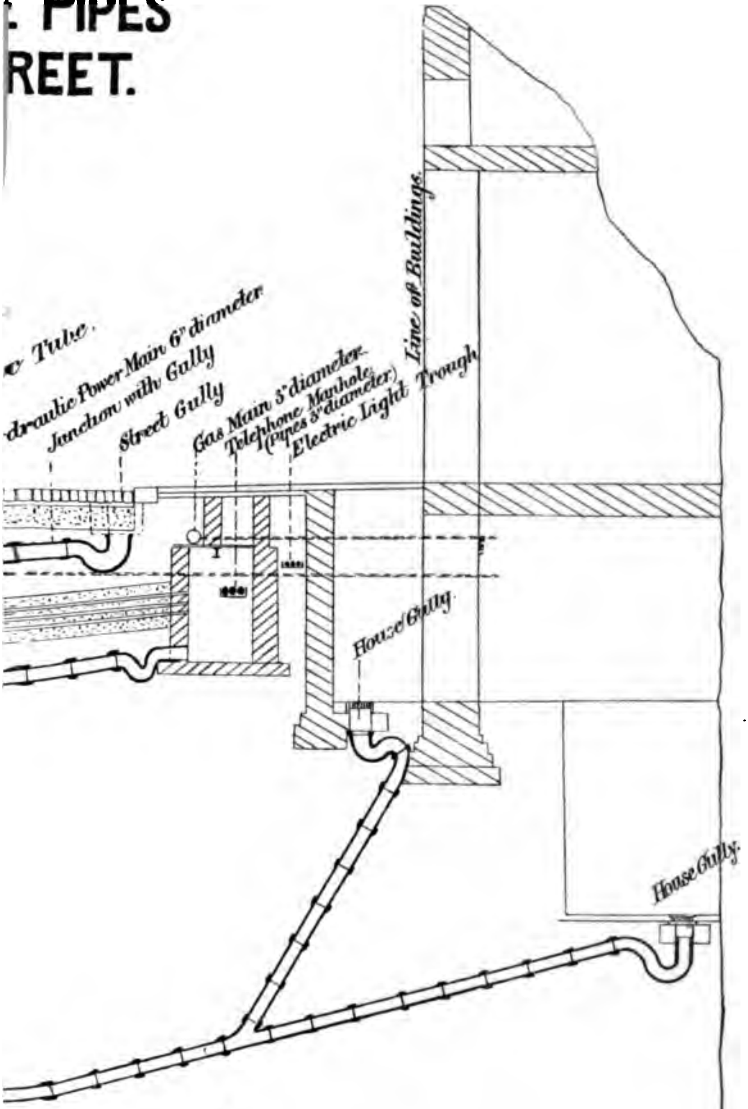
Owing to modern requirements a large number of pipes have now to be provided for in most towns. The accompanying typical section through a Manchester street indicates the pipes and other appliances which are laid under that street (facing p. 492).



TRANSVERSE SECTION OF SUGGESTED THOROUGHFARE

STANFORD LIBRARIES

E PIPES
REET.



Note.

This section shows drains as they existed when it was prepared.

All new house drains are properly intercepted.

Nottingha
10,935 acre
250,000
20 Open Spac
278 acres
No
Cannot say

hey comprise main and local sewers, drains, trunk water mains, ter supply mains and service pipes, hydraulic power mains d service pipes, gas trunk mains, supply mains and service es, telephone and telegraph pipes and conduits, pneumatic es, electric light and power conduits, and distributing elec- city mains and services. All these sewers and pipes require vision for inspection, and in some streets no space is left for ensions; when, therefore, it becomes necessary to duplicate e pipes great difficulty is experienced, and the alteration removal of existing pipes on an extensive scale is often essary.

bout five years ago I prepared a scheme for subways under ection of new streets at Manchester; the estimated cost hese structures, which were only sufficient for the ordinary irements of the particular streets, amounted to about ,000 per mile, and as they would not form part of an nsive system I was unable to advise their adoption.

STREET CLEANSING.

e question of street cleansing is one that more nearly rns sanitary reformers than street construction or sub- , as ill-scavenged streets not only cause discomfort to the using them, but also doubtless have a detrimental effect the general health of those residing in the immediate ty. The efficient slopping and cleaning of roads in wet er, and the removal of dust in dry weather, and watering, ints to which special care has to be given, and without good gement large districts cannot be properly administered.

cost of cleansing the streets in the City of Manchester ried from about 1s. to 2s. per 1000 square yards cleansed num, during the past fifty years. In the same period the n the rateable value has varied from 1½d. to 3⅝d. in the lst the rate of labourers' wages has increased from 12s. 6d. . The net expenditure per annum has increased from in 1849 to £44,527 in 1899, the area cleansed having creased from 118 million square yards to 554 million yards in the same period.

following tabulated statement shows the superficial areas public ways, the net expenditure on scavenging, the cost 0 square yards, the number of loads of street sweepings d, &c., from the year 1849 to 1899 inclusive:—

Statement showing the Expenditure on the collection of warehouse dust, watering streets, cleansing courts and passages, and sweeping the streets, footpaths, &c., during the years 1849 to 1899 inclusive.

Date.	Yards of Surface Swept.	Net Expenditure of Scavenging Department.			Cost per 1000 square yards.		No. of Loads of Street Sweepings.	No. of Loads of Bell Dust.	Tons of Rubbish Carted to Tip.	Cost per £1 on Rates.	Rates of Labourers Wages.	
		£	s.	d.	s.	d.				d.	s.	d.
1849	118,247,016	7,714	6	1	1	2¼	32,355	5,575	3,288	1¾	12	6
1850	124,294,098	7,357	9	0	1	1⅛	30,795	3,454	6,235	1¾	13	6
1851	128,228,611	8,843	11	3	1	1⅝	32,399	3,618	8,218	2	13	6
1852	128,340,406	6,685	6	11	1	0¾	29,952	3,090	7,298	1¼	13	6
1853	133,778,500	6,707	0	7	1	0½	34,059	3,274	7,511	1½	13	6
1854	146,062,610	7,997	8	6	1	1¾	34,792	3,217	6,051	1¾	13	6
1855	152,103,578	9,081	2	2	1	2	34,509	2,879	4,449	2	13	6
1856	153,797,425	8,993	13	2	1	2¼	32,309	2,905	3,320	2	13	6
1857	156,538,465	9,133	6	10	1	2⅛	28,212	2,628	3,056	2	13	6
1858	156,014,005	9,622	3	2	1	2¼	27,508	2,390	2,639	2	13	6
1859	157,020,202	9,507	3	4	1	1¾	28,823	2,581	2,774	2	13	6
1860	153,838,770	9,193	10	6	1	2⅛	29,400	2,976	3,360	1⅞	13	6
1861	156,018,837	9,345	14	3	1	2¼	29,020	2,709	3,437	1¾	13	6
1862	157,149,958	9,458	5	7	1	2¼	27,142	2,518	3,441	1¾	13	6
1863	157,659,240	9,419	19	0	1	2½	26,911	2,298	2,965	1⅞	13	6
1864	158,341,599	9,844	9	9	1	2	28,036	2,588	2,032	1¾	13	6
1865	159,513,674	9,201	5	10	1	2	27,182	2,567	2,793	1¾	13	6
1866	159,770,207	9,644	2	7	1	2½	28,790	2,530	3,058	1¾	15	0
1867	162,429,372	9,989	12	0	1	2¾	29,593	2,532	3,328	1¾	15	0
1868	162,489,417	11,142	12	2	1	4	30,237	2,667	3,937	1¾	15	0
1869	163,357,751	14,169	19	2	1	4½	29,341	2,714	2,988	2	15	0
1870	163,376,048	11,754	6	1	1	5¼	28,987	2,718	2,944	1¾	15	0
1871	171,272,759	12,231	14	0	1	5⅛	30,982	2,685	4 209	1¾	15	0
1872	179,750,191	12,714	16	6	1	5	34,297	3,059	4,121	1¾	16	0
1873	170,515,914	12,156	7	11	1	5½	30,817	2,990	8,037	1¾	16	0
1874	181,421,258	13,822	7	0	1	6⅜	32,269	2,919	7,690	1¾	17	0
1875	183,104,393	16,154	12	2	1	9¾	31,064	3,098	6,701	2	17	0
1876	239,332,482	27,070	11	0	1	6½	41,246	3,901	7,632	2	17	0
1877	281,908,885	27,700	13	9	1	10	50,939	3,632	10,385	3	17	0
1878	294,833,098	25,106	6	3	1	8½	48,546	3,901	14,141	2¾	17	0
1879	297,177,526	28,968	0	11	1	11½	53,864	3,879	14,200	3	17	0
1880	325,118,277	27,196	15	9	1	8	50,314	3,480	17,260	2¾	18	0
1881	343,663,656	24,694	7	5	1	5¼	53,290	4,076	13,468	2½	18	0
1882	196,406,273	14,366	17	4	1	4	26,747	2,338	8,015	2¼	18	0
1883	326,748,887	20,782	11	3	1	3½	46,036	3,578	12,248	2¼	16	0
1884	368,396,875	20,150	4	1	1	1	45,178	4,225	13,887	2⅛	18	0
1885	370,191,709	18,817	19	1	1	0⅛	44,778	4,256	20,270	2	18	0
1886	375,982,549	20,928	1	7	1	1¼	51,733	4,467	22,504	2	18	0
1887	399,429,135	22,671	4	8	1	1½	57,324	4,115	15,734	2⅛	18	0
1888	418,891,142	20,998	14	5	1	0	53,691	4,840	13,817	2	18	0
1889	418,217,214	21,288	16	8	1	0	54,810	4,659	17,115	2	18	0
1890	420,736,076	22,672	3	2	1	0¾	54,850	4,679	17,793	2¼	20	0
1891	452,834,961	30,789	9	6	1	4½	59,933	5,130	19,324	2⅝	20	0
1892	515,332,615	43,289	4	3	1	8	71,013	4,956	11,075	3⅝	20	0
1893	519,053,633	42,628	5	2	1	7	69,411	4,580	8,992	3 5/9	20	0
1894	535,492,654	42,623	0	11	1	7 1/12	58,015	4,846	8,090	3⅝	20	0
1895	539,974,062	41,433	6	9	1	6⅓	62,876	5,904	16,533	3 5/9	20	0
1896	543,330,704	40,421	15	11	1	5¾	58,436	9,138	14,776	3 5/9	20	0
1897	556,472,760	42,948	0	0	1	6 2/9	61,248	9,823	14,467	3 4/9	20	0
1898	549,443,092	41,496	11	6	1	6 1/9	57,860	10,256	10,854	3¼	20	0
1899	554,240,530	44,527	13	1	1	7¼	60,381	10,253	8,549	3¾	21	0

The above statement is exclusive of the cost of removing ouse refuse, slaughter-house offal, &c.

In a City like Manchester where the work is carried out on a od system under skilled supervision, it can be done in a satis- ctory manner, but in country districts where long lengths of ad have to be maintained and where the question of cost is en one of first consideration, the difficulties are, as a rule, t met as they should be. The result is that in some parts of country, the roads are either not watered at all, or only asionally watered.

During a dry season the macadam or other road metal quently becomes broken up, and the road disintegrated from s cause. I have always held the opinion that road watering ecessary, not only as a sanitary measure for laying the dust also for the preservation of the road surface. This view, I ieve, is now more generally accepted by the county councils n it was some years ago, when this question was the subject nany arbitrations between county councils and local authori- in England.

GENERALLY.

closing these remarks I desire to say that they have been ten with the express intention of promoting discussion, and ll be very pleased to hear the opinions of the municipal neers of this country if they will be so good as to favour us them. I have referred in very general terms to subjects h I thought would be of interest. Speakers will perhaps ion, if possible, the cost of works to which they may refer, e financial side of the question is, as a rule, most closely dered and very properly so, by all municipal authorities.

conclusion, I would observe that I have especially referred Treatment of Sewage, Streets, Open Spaces, and Subways, ng subjects suitable for discussion in this city, where the ificent boulevards, avenues, and streets, surpass those of her city. I remember many years ago being permitted Commissioner of Engineering to inspect the subways of ty, and to those of you who have not seen them I would ly recommend a visit to underground-Paris before you

[illegible]

Schedule of Parks and Places of Recreation in the [illegible]
with the Population of [illegible]

Name	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1 Queen's Park	[illegible]	Ornamental park [illegible]	[illegible] Ward	[illegible]	[illegible]	
2 Willert Street Open Space	1 1 [illegible]	Gravel space for recreation [illegible]	Harpurhey Ward	[illegible]		
3 Harpurhey Open Space	8 0 [illegible]	Gravel space [illegible] shrubberies, gymnasia for males and females	Harpurhey Ward	[illegible]		[illegible]
4 Phillips Park	[illegible]	Ornamental park [illegible] gymnasia, open air bath, bowling & tennis grounds, and recreation ground	[illegible] Ward	[illegible]	[illegible]	
5 Clayton Open Space	[illegible]	Not laid out	Bradford Ward	[illegible]		[illegible]
6 Bradford Open Space	8 1 11 14	Gravel space for recreation, shrubberies, gymnasia for males and females	Bradford Ward	[illegible]		[illegible] 17 [illegible]
7 Ardwick Green Open Space	4 3 26 0	Ornamental gardens, shrubbery, and promenade	Ardwick Ward	41,[illegible]	[illegible] 0 0	......
Cheetham Park	5 1 36 0	Ornamental gardens, gymnasia, bowling and tennis grounds, and recreation ground	Cheetham Ward	37,740	.. ...	[illegible],000 0 0

APPENDIX A.—continued.

	Name.	A				B	C	D	E			F		
		Size, Net Area.				Character of Park.	District where situate.	Population of Ward in which the Park or Place of Recreation is situate.	Valuation of Land, &c., presented.			Original cost of Land, &c.		
		a.	r.	p.	y.				£	s.	d.	£	s.	d.
9	Alexandra Park	60	0	0	0	Ornamental gardens, gymnasia, bowling and tennis grounds, promenade and recreation grounds	Moss Side	23,833 (Not in Manchester)	......			24,000	0	0
10	Prussia Street Open Space..	1	1	29	24	Gravel space for recreation, gymnasia for males and females	New Cross Ward	44,727	......			12,982	10	0
11	Butler Street Open Space...	0	0	34	9	Gravel space for recreation	New Cross Ward	Do.	1,462	14	0	......		
12	Gibbon Street Open Space...	2	2	22	16	Cinder open space, not yet laid out	New Cross Ward	Do.	......			......		
13	John Street and Pott Street Open Space	....				Under construction	New Cross Ward	Do.	6,673	0	0	1,600	0	0
14	Helmet Street (late Mount Street) Open Space	2	0	4	24	Gravel space for recreation, shrubberies, gymnasia for males and females	St. Clement's Ward	10,386	1,469	16	6	560	0	0
15	Queen Street Open Space...	0	0	23	5	Not yet laid out	St. George's Ward	37,672	......			200	0	0
16	St. Michael's Open Space ...	1	2	22	27	Disused burial ground, flagged ground for recreation, gymnasia for males and females	St. Michael's Ward	30,745	......			......		
17	Denmark Road Open Space	0	1	10	25	Gravel open space, trees, and shrubs	All Saints' Ward	23,273	......			......		
18	Birch Fields Open Space ...	32	1	0	12	Shrubberies, cricket, football, lawn tennis, bowling green, and quoiting grounds, gymnasia, and recreation ground	Rusholme Ward	19,876	......			7,930	0	0
19	Boggart Hole Clough, for Public Walks, &c.	76	0	17	21	....	Blackley and Moston Ward	18,675	......			4,885	0	0

APPENDIX A.—continued.

Name.	A Size, Net Area.				B Character of Park.	C District where situate.	D Population of Ward in which the Park or Place of Recreation is situate.	E Valuation of Land, &c., presented.			F Original cost of Land, &c.		
	a.	*r.*	*p.*	*y.*				£	s.	d.	£	s.	d.
20 Lewis's Recreation Ground.	19	0	0	0	Under construction	Blackley and Moston Ward	18,675	......			......		
21 Low'r Crumpsall Open Space	1	1	12	19	Gravel space for recreation, shrubberies, gymnasia for males and females, and tennis ground	Crumpsall Ward	11,751	731	0	0	......		
22 Higher Crumpsall (Oak Rd.) Open Space (Plot 1)	8	0	6	16	Not yet laid out	Crumpsall Ward	Do.	......			5,000	0	0
23 Higher Crumpsall (Oak Rd.) Open Space (Plot 2)	4	0	23	15	Not yet laid out	Crumpsall Ward	Do.	......			3,900	0	0
24 Openshaw Open Space ... (George Street)	7	1	17	18	....	Openshaw Ward	27,890	......			7,360	9	5
25 Gorton Open Space... ...	16	0	0	20	Shrubberies, bowling green, cricket, football ground, and recreation ground	St. Mark's Ward	16,711	......			20,602	17	3
26 Newton Heath (Gaskell St.) Open Space	2	2	11	14	Gravel space for recreation, shrubberies, gymnasia for males and females	Newton Heath Ward	18,099	3,115	15	0	......		
27 Ten Acres Lane Bridge (Newton Heath) Open Space	....				Not yet laid out	Newton Heath Ward	Do.	......			......		
28 St. John's Ward Open Space	0	0	39	15	Gravel space for recreation	St. John's Ward	9,081	......			......		
29 St. Mary's Open Space ...	0	2	24	24	Ornamental garden	Exchange Ward	506	......			......		
30 St. Ann's Open Space ...	0	0	23	10	Ornamental garden	St. Ann's Ward	118	......			......		

APPENDIX A.—continued.

Name.	A				B	C	D	E			F		
	Size, Net Area.				Character of Park.	District where situate.	Population of Ward in which the Park or Place of Recreation is situate.	Original cost of Land, &c.			Original cost of Land, &c.		
	a.	r.	p.	y.				£	s.	d.	£	s.	d.
31 Openshaw (Whyatt Street) Open Space	0	3	27	18	Gravel space for recreation.	Openshaw Ward	27,890	5,587	0	0	......		
32 Openshaw (Delamere Street) Open Space	6	1	20	9	Under construction	Do.	Do.	......			7,356	3	3
33 Bellott Street Open Space...	1	0	32	22	Shrubberies, bowling and recreation grounds	Cheetham Ward	37,740	5,456	12	6	......		
34 Donkey's Common Open Space	4	0	7	19	Gravel space for recreation	Ardwick Ward	41,295	4,603	0	0	......		
35 Whitworth Street Open Space	0	3	27	7	Not yet laid out.	Oxford Ward	2,287	......			25,526	0	0
36 Christ Church Square Open Space	0	2	7	18	Paved space for recreation.	St. George's Ward	37,672	......			1,741	19	3
37 Brookdale Park	45	0	26	24	Not yet laid out	Newton Heath Ward	18,090	......			26,500	0	0
38 Crowcroft Park	17	2	0	0	Not yet laid out	Longsight Ward	16,953	......			13,234	0	0
39 Plymouth Grove Open Space	4	0	0	0	Not yet laid out	St. Luke's Ward	36,676	......			4,000	0	0
TOTAL... ...	405	2	29	19				58,777	0	0	190,226	16	5

Prof. Corfield proposed that the conference should accord a hearty vote of thanks to their President for his excellent address. He regretted that he had not thought fit to say more of his own work in Manchester.

Mr. P. C. Cowan (Chief Engineering Inspector, Local Government Board, Ireland), in seconding the proposition, congratulated the President on the work he had done, not only in recent years in Manchester, of which he had said much less than they would all have liked, but upon the beautiful sanitary museum he had organised at Hornsey twelve or fifteen years ago. Much valuable information could be got from the classical reports of the city of Manchester, and some of the hints might be found useful even in Paris, where they seemed able to provide so many good things not yet obtained in many English towns, such as a pure river, ample open spaces and fine streets.

The vote was put and carried unanimously.

Dr. S. Rideal (London), who opened the discussion, said the chief difficulties of the sanitary reformer in England and in all countries arose from past legislation and were not avoidable. River pollution in the Mersey and Irwell and other watersheds was now inevitable. They had to allow sewage effluents and waste waters in their streams; whether it was wise to do so or not remained to be seen. It was possible under certain circumstances to allow a certain amount of raw sewage matter to go into a stream without any evil consequences. The problem was to ensure that the streams should remain in a state which was not injurious to health, and suitable for acting as intended by nature for discharging surplus waters to the sea, for the life of fish, and for navigation or boating. Organic matter in suspension was that which caused the greatest difficulty. Future legislation should be based upon the consideration of what ratio the volume of sewage discharged bore to the volume of the stream. Large volumes of sewage might go into a large stream without detriment to towns lower down, even when the water was there required for drinking purposes. The legislature should establish a ratio between the volume of a stream and the volume of sewage proposed to be discharged into to it. In Manchester they had tested bacteriologically the effluents by the incubation test. In the incubation test the purity of water was ascertained by the fact of whether after keeping it for a time the sample becomes putrid or not. If after standing for a certain period the water under test did not putrefy then the water was satisfactory. This did away with the whole question of standards, which were always more or less unsatisfactory. Experiments had proved that if the oxygen in the effluent did not fall below fifty per cent., then the water would keep in a satisfactory condition. As Mr. Meade had shown, the secret of success was in trying to induce manufacturers to discharge slowly and not in flushes. Under this system they would have no trouble whatever in dealing with the sewage question except perhaps in cases of some special kinds of manufacture. Breweries and soap works, for instance, should be required to discharge their refuse slowly. England had small water supplies, in America they were much greater. The water supply of Paris was sixty-six gallons per head of population per day.

Mr. **Rudolf Hering** (New York) began by referring to the disadvantages under which they laboured in America from their frequent political changes. Their local administration was a total failure so far as municipal government was concerned. A civil engineer held office for only one or two or sometimes four years, and then went out. If he could not stay to carry out his plans, he could not possibly take the same interest in his work. His country was a new one, and developed very rapidly. Their water supply was not of so good a quality as they got in Europe, but there was a growing demand for better water, because they knew from the bacteriologists that good looks did not make good water. In Plymouth there was a case of typhoid in the winter. The search for its causes revealed the fact that at a certain point excreta had been thrown out on the snow, and typhoid broke out in a part of the town that was supplied with the purest water. They had now learned the necessity of keeping out germs, and it was suggested that they should now filter the water, even if it came from mountain regions. The daily supply in the great towns was larger than in Europe. Philadelphia gave 160 gallons per head per day, Buffalo 200 gallons per head. With regard to the disposal of sewage they had no difficulty. They could throw sewage into their rivers, and not even chemical tests could find it. The sewage of New York could not be found anywhere after it had been discharged into the Hudson River. In Philadelphia, where they had the Delaware River, it was the same. At Chester, twelve miles below Philadelphia, the water of the Delaware River was used for drinking purposes. At Chicago they had had some trouble. Around Lake Michigan sandy ground was limited, and sewage treatment by land filtration would have cost £2,000,000. It was suggested that they should dig a channel in which to discharge the sewage of Chicago, and that they should largely dilute it by letting into the channel the water of the lake. They executed the canal, but then found it only half large enough. The dilution, which was a necessary part of the process, was so complete that it had raised the water level of the Mississippi 1 ft. At Providence the precipitation system was carried out, but it would not purify strong sewage. They had very few irrigation systems in America, because all the large cities were situated on large rivers. The discharge of solid sewage was a different question.

Mr. H. **Alfred Roechling** (Leicester) observed that, from an economic point of view, it was not desirable to increase the water supply of a town beyond a certain quantity per head and day. As to the septic tank treatment, whilst he was alive to the necessity of breaking up the solids, he thought that such a treatment encouraged changes in sewage, which distinctly increased the work to be performed by the oxidation beds, and for this reason he thought it would be preferable to break up the solids by mechanical means such as screens, &c. He quite agreed with Dr. Rideal, that the standard to be employed as to the purity of an effluent was the self-purifying power of the stream into which the effluent went; but as this changed throughout the year it was necessary, from a legal point of view, to have a recognised standard based on the minimum of self-purifying power. Finally, Mr. Roechling drew attention to the question of management of sewage works of any kind. These works were very delicate organisms, and ought not to be placed in the hands of inexperienced men; on the contrary, in order to ensure success, they ought to be in the charge of thoroughly capable and experienced superintendents.

CONFERENCE OF SANITARY INSPECTORS.

ADDRESS

By W. H. GRIGG.

(Associate.)

President of the Conference.

THE STATUS AND DUTIES OF A SANITARY INSPECTOR IN ENGLAND.

The feeling which I am sure is uppermost in the mind of every person present is one of gratitude to the Société Française d'Hygiène for the reception which has been extended to the Institute on the occasion of our meeting in this beautiful city of Paris, and my sincere desire is to express as adequately as I can that sentiment. But I find myself in a somewhat invidious position for the proper discharge of this duty, because, although as a humble member of the visiting body of some years standing I am a participator of this hospitality, I happen to have been also for some years a member—an insignificant member—of the illustrious body who are so generously acting as hosts on this occasion.

There may be—doubtless are—considerations of state (political reasons perhaps) which not only split up the inhabitants of countries into sections or parties, but which are regarded as of sufficient importance to cause suspicion and even strife between nations. It has ever been thus, and the end is not yet; but to us, as guardians of the public health, administrators of the laws relating thereto, seekers after the best means of improving the health of the world—for enabling humanity to get the best out of life and to make that life brighter and better, we know no limit of party or country—we are citizens of the world, and our chief enemies are ignorance and dirt.

The great object of these Conferences is, of course, the enabling of every attentive participator to improve his knowledge of the subjects discussed, and to compare experiences in order that the best system or systems of work might be arrived at.

When I have previously visited this city, as well as other Continental cities, I have obtained very much enlightenment from what I have seen and been told, but I have always felt that I had not obtained the best possible results in consequence of my lack of knowledge of the details of administration, the exact status of the respective officers, and their relations to one another, and I am led to suppose that this same difficulty is in the minds of our neighbours, who are doubtless as anxious as we are to obtain the advantages which can accrue from perfect knowledge alone. I therefore propose to confine myself in this address to as full a detailed view of the status and duties of an officer who, in England, is universally considered essential to efficient sanitary administration, to whom, I believe this city has no corresponding official—the Sanitary Inspector. If I weary those of you who are better acquainted with the details of the subject than I am myself, you will I am sure make such allowances as you deem my object worthy of, and I will therefore now proceed with the task I have set myself.

There are three authorities who largely exercise the power to appoint Sanitary Inspectors, namely: (*a*) County Councils, (*b*) Urban Sanitary Authorities, and (*c*) Rural Sanitary Authorities. Others, I am aware, have also exercised this authority in the past, such as Boards of Guardians, but this has fallen into desuetude; and although a few are appointed by Port Sanitary Authorities, River Boards, &c., still the above statement may be taken as correct.

For the reasons that my subject is a very large one and my time limited; that the differences between the duties of an Inspector to an Urban Authority and a Rural are generally of detail and not of sufficient moment to interfere with my object, and because our Parisian hosts would probably prefer it, I shall limit myself to an Inspector's position and work in London, and not in rural England. The Local Government Board in England is a Government Department which is supreme in matters of sanitary administration, and is by law given a supervising position as regards both County Councils and District Authorities. The London County Council is composed of 137 members, elected by Greater London, which had, at the middle of 1900, an estimated population of 6,652,145, and a rateable value of £45,093,000; it is the authority for that part of sanitary administration which is best centralised. The remainder is under the Urban Authorities, of which there are forty-two in London, varying in population from 350,000 to 11,750. These are by law compelled to appoint "a sufficient number" of properly qualified men as Sanitary Inspectors. "Sufficient number" is not defined, but is generally accepted s meaning about one to every 20,000 of population, and, as matter of fact, there are about 260 Sanitary Inspectors in ondon alone. If this "sufficient number" are not appointed, he Local Government Board have power to compel the deaulting authority to appoint them, or, if they fail to comply with an order to do so, the Local Government Board may hemselves appoint. It has never yet been necessary for the ocal Government Board to exercise this power. The duties f the Sanitary Inspector are briefly as follows:—

By systematic inspection of his district and otherwise, keep himself informed as to nuisances therein.

To attend to complaints of nuisances or infractions of the law or of bye-laws.

To see that any regulations made in respect of offensive or noxious trades or manufactures are properly observed.

To inspect food exposed or in preparation for sale for human food, seizing unsound food and obtaining its condemnation.

To collect samples of food and drugs for analysis and to take proceedings against offenders.

To see to the proper execution of works ordered by the Sanitary Authority for the abatement of nuisances.

To see that regulations for keeping animals in a cleanly state are properly carried out.

To observe nuisances from smoke.

To inspect the drainage and sanitary fittings of houses, workplaces, etc.

To test drains.

To take steps for the abatement of overcrowding, and for the proper regulation of lodging-houses.

Inspection of canal boats.

Inspection and carrying out of regulations in respect of dairies, cow-sheds, and milk-shops.

Regulation of slaughter-houses.

The maintenance of workshops in a cleanly state and regulation of temperature and purity of atmosphere therein.

The above, although not inconsiderable, by no means exhaust he list of the duties, but are sufficient for my present purpose, nd it is obvious that to perform these duties with efficiency a Sanitary Inspector must be a man of no mean talents. Time was when men were appointed for reasons of personal influence nd friendship, but this is becoming continually less frequent; ndeed, in London he is now required to possess a certificate of he "Sanitary Inspectors Examination Board" before he is eligible for the office, and I cannot do better than give here the syllabus of the requirements of that body to show what those qualifications must be. It is as follows:—

A Preliminary Examination upon the following subjects:—

English, including writing, spelling, composition, and dictation.

Arithmetic, including fractions, vulgar and decimal, simple proportion, common weights and measures, mensuration of rectangles and rectangular solids as required by Schedule 1, Standard 6, of the Day School Code, 1898, of the Education Department, together with mensuration of circles, cylinders, and spheres, and a Technical Examination upon the following subjects so far as they bear upon the duties of a Sanitary Inspector:—

1. Elementary Physics and Chemistry in relation to Water, Soil, Air, and Ventilation.

2. Elementary Statistical Methods.

3. Municipal Hygiene or Hygiene of Communities, including Prevention and Abatement of Nuisances, Sanitary Defects in and about Buildings and their Remedies, Water Supplies, Sanitary Appliances, Drainage, Refuse Removal and Disposal, Offensive Trades, Disinfection, Food Inspection.

4. Statutes, and the Orders, Memoranda, and Model Bye-laws of the Local Government Board, and the Bye-laws in force in the Administrative County of London.

Now it will scarcely be credited that the officer who is required to possess these qualifications and carry out the multifarious duties described above is, excepting in a few special cases, liable to dismissal by the body who appoints him at very short notice, and without any reason being given, and without the right of appeal to a superior authority, notwithstanding the obvious fact that a fearless discharge of his duties must frequently bring him in unpleasant contact with members of his employing body. Much is being done to induce Parliament to grant the removal of this injustice, and we have every reason to be satisfied with the progress made.

I hope that I have succeeded in satisfying my hearers in the task I have set out on—to make clear to those whom I presumed to be quite unacquainted with the details of the status and duties of a Sanitary Inspector in London—just what that position really is—and I will now mention a few points which might open up discussion interesting alike to our hosts and to ourselves. A very interesting subject is the supervision and control of the food supply, especially of large towns, and in this connection many here will be surprised to know that in London there is nothing corresponding to the grand abattoir which is to be seen in this city of Paris. Steps were started by the London County Council to put London on somewhat of a level with all the other great cities of the world in this respect, but so great was the influence brought to bear by private interests that their object was defeated; but this can certainly be for a time only. The collection of samples of food and drink for analysis and the detection and punishment of adulterators is, in England, a tortuous and difficult one, and when the fraudulent practice is brought home to offenders, justices regard the offence as being so trivial that the punishment imposed is no deterrent, a fine of 5s. with 10s. 6d. costs for selling as milk an article containing 30 per cent. of water being no uncommon result.

I am afraid I am wearying you, and will, in conclusion, mention a few very important subjects which might well be discussed at a meeting like this, such as:—

(1) The desirability of a Ministry of Public Health.

(2) Cremation of the bodies of persons dying of infectious diseases.

(3) Security of tenure and superannuation of Health Officers.

(4) Whether discovery that tins of *(a)* meat, *(b)* fish, and *(c)* fruit, are "blown" is a sufficient reason for seizing them as containing unsound food.

And, finally, I would mention a matter which has exercised my mind a good deal during the progress of the unfortunate war in South Africa; not that it is peculiar to that case, as I believe the same result is found in all wars of any magnitude and of more than short duration, I mean the enormous number of deaths from what we are taught to regard as preventible diseases, and whether these may be, if not actually prevented, at any rate ameliorated by the education and organisation of efficient sanitary staffs for the purpose.

Many more matters present themselves to one on an occasion such as this, but I will refrain and thank you for the honour you have done me in placing me in this proud position as your president, for your patience during what must have been to many a very elementary discourse; but if I shall have done even a very little towards bringing our brother officers in this great nation of France and ourselves into a closer bond of union, something to advance what, I am convinced, is alone necessary to render that union indestructible—a knowledge of each other—I shall be prouder of it than of any other act of my life.

It was proposed by Mr. **Wynter Blyth** and seconded by Mr **Curtin**, of Lincoln, that a hearty vote of thanks be accorded to Mr. Grigg for his address.

Mr. J. H. **Ollett** (Eastbourne) said that in view of the lateness of the hour he would only detain them a few minutes by a few remarks of the many and onerous duties of the inspector, the inadequate remuneration he received, the uncertainty of his tenure of office and grant of pension when unable to perform his duties. He pointed out the fact that the inspector's duties were not only so varied, but that in each he had to be an expert, even in such diverse matters as the planning of drainage, &c., and the examination of the various food supplies. The uncertainty of period of appointment must, as pointed out by Mr. Hering of New York, tend to prevent the inspector taking that interest that is desirable in his work.

Mr. T. C. **Barraler** (Godstone R.D.C.) expressed the opinion that the status of both urban and rural inspectors had much improved of recent years. He criticized the composition of the new Examination Board as not comprising a single representative of the profession. He advocated the appointment of Superintendent Sanitary Inspectors for Counties as a counter check to local influences, and thought we were unnecessarily afraid of "centralization" in sanitary administration. The beautiful city they were in showed many examples of its advantages.

Mr. J. **Bastiman** (Scarborough) said that the position of the Sanitary Inspector and Inspectors of Nuisances in England to-day was unsatisfactory in many respects, the more important of which were: 1st, insecurity of tenure of office; 2nd, inadequate remuneration; and 3rd, no superannuation allowance provided in case of disablement or old age. This he believed to be unjust as he considered in taking into consideration the onerous duties he had to perform there was no official that runs more risk in the exercise of these duties than the Sanitary Inspector. The terms of appointments varied from one to five years with one month's notice on either side to terminate the engagement, by and with the consent of the Local Government Board. But unfortunately for some and there are a great many who do not receive half of their salary through and by the consent of the Local Government Board. Hence such officials' services were liable to be dispensed with on any paltry or trivial connivance from a member of the body he represents; personally, he believed there was a much greater percentage of the first-named than the latter. The official was subject to the mercies or otherwise of the members of the Board and ratepayers by whom he was engaged and represents. For instance, the Sanitary Inspector in the exercise of his duties, that is to say, if he carried out those duties devolving upon him without fear or favour, was sure to tread on somebody's toes in the remedying of sanitary defects and nuisances calling for abatement. It is when that sore place was touched, namely, the pocket, that animosity was active in the owner of property, and the official position may be rendered not only uncomfortable, but even untenable. 2nd, Inadequate remuneration was provided for Sanitary Officials throughout the country, and the question of salaries was not on a sound basis. In the case of old officials who were appointed fifteen or twenty years ago at a stated salary no mention was made of any annual increment. And what was the result when an application was made for an increase of salary? He was frequently told, "Oh, we can get plenty of men to do the work for less money," and he was at the mercy of the City Fathers who, by a refusal to give a well-earned increase, caused him to suffer the ignominy and content himself as best he can with the words of the old saying, "half a loaf is better than none." However, he was happy to say that of late years there was an improvement in this respect in making appointments. A commencing salary was stated in the advertisement with annual increments to a maximum. This had been achieved, he believed, mainly by the labours of the old officials who have never hesitated in pegging away and knocking at the doors of the local exchequer. 3rd, Superannuation to officials at a given age or after disablement of being able to serve in office. Speaking generally, this is a knotty question, and personally, he was not in favour of relinquishing office or accepting any remuneration whatever, excepting in the case of disablement rendering the officer unable to effectually carry out the duties of the office, or unless his continuance in office be detrimental to the interest of the authority or ratepayers he represents. Should this arise, then he thought it was the bounden duty of such authority to provide superannuation allowance for their officials. Failing which, legislation should step in and provide a remedy. The duties of the Sanitary Inspectors or Inspectors of Nuisances are those defined by the General Order of the Local Government Board, dated the 23rd of March, 1891, so far as such Order relates to the duties of Inspector of Nuisances. The latter term, Inspector of Nuisances, being the legal definition prescribed for officers in the provincial towns under the Public Health Act, 1875. In passing he would just add that the duties of officers vary somewhat in different parts of the provinces, re inland towns v. sea ports and health resorts than those enumerated under the Local Government Board.

ARTICLES RELATING TO PUBLIC HEALTH,

Appearing in the chief British and Foreign Journals and Transactions.

Abstracts of Titles classified in this List under the following headings:—

Science in Relation to Hygiene and Preventive Medicine.
Hygiene of Special Classes, Trades, and Professions.
Municipal Administration.
Building Materials, Construction, and Machinery.
Water Supply, Sewerage, and Refuse Disposal.
Heating, Lighting, and Ventilating.
Personal and Domestic Hygiene.

The articles referred to in this list are as far as possible collected and filed in the Library of the Institute for the use of the Members and Associates.

Science in relation to Hygiene and Preventive Medicine.

Behla, R. (Luckau). Ueber neue Forschungswege der Krebsätiologie. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVII., p. 313.

Consideration of various directions in which enquiries into the etiology of cancer may be prosecuted, with special reference to parasites of vegetables.

Cecil, H. Cribb, B.Sc., F.I.C. The influence of temperature and concentration on the saline constituents of boiler water. *The Analyst*, July, 1900, p. 169.

Showing the changes in composition which are brought about when certain waters were heated in boilers working at different pressures, and indicating what proportion of the dissolved salts are deposited.

Fajardo, F. (Rio de Janeiro). Die Hämatozoarie des Beriberi im Gehirn. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVII., p. 249.

Drawings of a parasite (hæmatozoon) in the vessels of the brain. Parasite previously described by author (*ibid Bd.* XXIV., p. 567) as characteristic of beri-beri.

Genersich, Wilhelm (Budapest). Typhusepidemie. Durch Typhus bakterien infiziertes Trinkwasser. *Cent. f. Bakt., Parasit., u. Infektkrnht.*, Bd. XXVII., p. 241.

Demonstration by culture of the typhoid bacillus in water which had caused an epidemic of typhoid fever in parts of a small town (epidemic following heavy rain after long drought).

Harold, Faber. On the Composition of Danish Butter. *The Analyst*, August, 1900, p. 199.

Deals with the Variation in Chemical Composition of Danish Butter.

Kalischer, Dr. Otto. On the biology of the peptonising properties of milk-bacteria. *Archiv f. Hygiene*, Vol. XXXVII., Part.1, 1900, p. 30.

Influence of bacterial inoculation on removal of milk sugar. Absence of action on milk fat. Conversion of casein into peptones, etc. Production of rennet and other ferments.

Nuttall, George H. F. Neuere Forschungen über die Rolle der Mosquitos bei der Verbreitung der Malaria. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVII., pp. 193, 218, 260, 328.

Summary of recent observations and theories.

O'Reilly, M. F., D.Sc. Destruction of life and property by lightning. *Engineering*, June 15th, 1900, p. 769.

Electrical resistance of the human body. Death by lightning. Statistics as to deaths and loss of property by lightning conductors.

Rice, Arthur L. Compression and Liquefaction of Gases. *Engineering*, June 1st, 1900, p. 732.

Experiments on liquefaction of gases by Faraday and Davy. Colladon's apparatus. Dewar's experiments with liquid air. Experiments by Linde, Hampson and others.

Rice, Arthur L. Compression and Liquefaction of Gases *(con.)*. *Engineering*, June 8th, 1900, p. 762.

Table of physical constants determined with regard to liquefied gases—latent heat of air, power obtainable by expansion of liquid air, experimental uses of liquid air.

Ruzicka, Dr. Stanislav. Comparative inquiries on Bacillus pyocyaneus and Bacillus fluorescens liquefaciens. *Archiv f. Hygiene*, Vol. XXXVII., Part 1., 1900, p. 1.

Interchange of qualities peculiar to the individual organisms. The circumstances, such as wars, influences of higher temperatures and access of abundance of air, persistence of the newly acquired qualities for a considerable time.

SATA, Professor A. (Osaka, Japan.) Experimental contribution to the ætiology and pathological anatomy of the Plague. *Archiv f. Hygiene*, Vol. XXXVII., Part 2, p. 105.

The paper is very lengthy and exhaustive, embracing the behaviour of the plague bacillus on a large number of culture media; control experiments on many different animals; and very complete references to the bibliography of the snbject.

SCHATTENFROH, A., and GRASSBERGER. On Batyric Acid fermentation. *Archiv f. Hygiene*, Vol. XXXVII., Part 1., 1900, p. 54.

Ordinary conditions of increase and morphological behaviour of granulo bacillus immobilis. Chemico-physiological behaviour, development of Toxin and disease production of granulo bacillus immobilis.

SJÖBRING, NILS (Lund, Sweden). Ueber die Mikroorganismen in den Geschwülsten. *Cent. f. Bakt., Parasit., u. Infektkrnkht.* Bd. XXVII., p. 129.

Cultivation of rhizopoda (amœba) from various cancers, and sarcomata, but also from ovarian cystomata and uterine fibroids. Different species probably. Production by inoculation of rhizopods cultivated from cancer of cancerous tumours in mice.

Hygiene of Special Classes, Trades and Professions, and Municipal Administration.

BATEMAN, C. E., F.R.I.B.A. Small Houses. *Building News*, March 16th, 1900, p. 361.

Economy in construction. Plan. Number of stories. Roof coverings. Bedroom floor. Internal plumbing. Lighting of rooms. Scullery and kitchen. Decoration. External appearance.

BELL, G. JOSEPH. The management of Roads. *Engineering*, May 25th, 1900, p. 683.

The suggested future management of all roads by County Councils and the amendment and codification of all existing highway and bridge Acts.

EDITOR OF "THE BUILDER." Dwellings for the Poor. *The Builder*, Aug. 4th, 1900, p. 93.

Leading article upon the conference and exhibition.

Farkas, Dr. E. Das Problem der Fabrikstadttheile. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 3, p. 459.

The paper deals with the problem of factories in towns, and suggests that they should be removed from the inhabited portions of a town to special localities, which might with advantage be near cemeteries, so that the air from the open space could dilute the vitiated factory air.

Fleming, Owen. Working-class Dwellings. *Building News*, April 6th, 1900, p. 468.

The Boundary Street rehousing scheme of the London County Council. The cheapest buildings ever erected by the London County Council. Financial limitations.

Gerland, Otto. Handhabung der Gesundheitspolizei in der Stadt Hildesheim während der Jahre 1892 bis 1899, und ihre Erfolge. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4, p. 505.

The paper deals with the sanitary administration in Hildesheim from 1892 to 1899:—I, Health of town; 2, Dwelling houses; 3, Water; 4, Food; 5, Factories; 6, Schools; 7, Prisons; 8, Provisions for sick and weak persons; 9, Baths; 10, Identification of dead bodies and burials; 11, Hospitals. The paper contains a number of regulations and byelaws notably in reference to disinfection.

Henman, Wm., F.R.I.B.A. Modern Hospitals. *Building News*, March 16th, 1900, p. 359.

The necessity for hospitals. Main principles influencing their design. Hospital accomodation and equipment. Temporary buildings. Site for hospital. Ventilation, etc.

Honeyman, John, F.S.A. Working-class Dwellings. *The Building News*, April 6th, 1900, p. 467.

Effect of injudicious legislation on building regulations. Relaxation of present building regulations. Remedies.

Löblowitz, Dr. J. T. Frauenasyle. *Deutsche Vierteljahrsschrift f. Gesundheitspflege*, Bd. XXXII., Heft 4, p. 567.

The author endeavours to show (1) that the erection of institutions, in which syphilitic prostitutes are retained during the period of their infectiousness, is the best means of stopping the propagation of this disease; (2) that this proposal admits of being carried out in practice.

MARCUSE, Dr. J. Bäder und Badewesen der Neuzeit. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 3, p. 345.

The paper gives first an historic review of the development of public baths since ancient times. It describes then, with plans and sections, some public baths in Germany, and finally deals with the hygienic value of these institutions.

NEWMAN and NEWMAN. Description of Infirmary Buildings, Ladywell, Kent. *The Builder*, July 21st 1900, pp. 56 & 57.

Four plans and a letterpress description of the buildings.

ROESELER, Dr. P. Gesundheitliche Uebelstände und Gefahren der Acetylenbeleuchtung und ihre Verhütung. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*. Bd. XXXII., Heft 4, p. 547.

The paper deals shortly with the present state of the manufacture of Acetylene and examines afterwards carefully to what extent the requirements of hygiene especially in reference to safety and harmlessness of the gas and its products of combustion are observed therein.

ROESELER, Dr. P. Das Wassergas, seine Herstellung, Verwendung und hygienische Bedeutung. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*. Bd. XXXII., Heft 3, p. 410.

The paper deals with water-gas, its manufacture, use, and hygienic importance, and suggests remedies.

SCHENK, Dr. P. Die Nothwendigkeit der Errichtung von Trinkerheilstätten. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*. Bd. XXXII., Heft 3, p. 391.

The paper deals with the necessity of erecting institutions for curing drunkards.

SPALDING, HENRY. Working-class Dwellings. *Building News*, April 6th, 1900, p. 468.

Associated dwellings and self-contained tenements. Block dwellings. Self-contained tenements.

STÜBBEN, J. Die weiträumige Bauweise im Stadterweiterungsgelände zu Stuttgart. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4. p. 505.

The paper combats two pamphlets which have lately been published against the spacious laying out of the unbuilt on portions of Stuttgart, and advocates the laying out in zones in which the density of the population gradually decreases with the distance from the centre of the town. Such an arrangement does not affect injuriously owners of land but curtails excessive speculation in building land.

Wallis, W. E. Working-class Dwellings. *Building News*, April 6th, 1900, p. 468.

The Peabody buildings. Fallacies as to ventilation.

Water Supply, Sewerage, and Refuse Disposal.

Bock, A., und Schwarz, F. Versuche über mechanische Klärung der Abwässer der Stadt Hannover. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 148.

The paper describes the experiments made at Hanover with the mechanical clarification of sewage, and gives in detail the results obtained with various velocities of flow through the settling tanks.

Dunbar, —. Beiträge zur Kenntniss des Oxydations verfahren zur Reinigung von Abwässern. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 178.

The author has made an extensive set of experiments with the artificial self-purification of sewage in contact or oxydation beds and concludes from this that besides biological agencies physical and chemical agencies also play an important part in this process.

Dunbar, —, und Zwirn, G. Beitrag zur Beurtheilung der Anwendbarkeit des Oxydations verfahrens für die Reinigung städtischer Abwässer. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 216.

The paper describes a series of experiments made with the artificial self-purification of sewage in contact or oxydation beds, with a view to ascertaining the applicability of this process for the treatment of town sewage. Concerning the cost of this process, the authors are of opinion that it may probably amount to from one to two Marks per head per annum.

Folwell, A. Prescott, M.Am.,Soc.,C.E. Cleansing catch pits and sewers. *The Engineering Record.* June 16th, 1900, p. 563.

To show disadvantages of catch pits from nuisance they cause and cost of employing. Necessity for periodical systematic cleansing of sewers.

Höpfner und Paulmann. Die Schmutzwasser-Reinigungsanlage der Stadt Cassel. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 130.

This is a description with plans and section of the sewage clarification works of the town of Cassel in Germany, and of the results obtained with them.

Jones, C. E., A.M.Inst.C.E. The nation's supply of water and its effective control. *The Surveyor*, Feb. 23rd, 1900, p. 211.

Increasing number of water-works. An independent national water Board. Court of appeal. Public advantages derived from a national control.

Maury, Dabney H. Electrolysis in Peoria. *The Engineering Record*, May 19th, 1900, p. 467.

Abstract of papers showing injury caused to water mains by electric currents—chiefly from electric tramways.

Monroe, W. S. Modern practice in Steam Heating and Ventilation (Chap. VII.) *The Engineering Record*, June 30th, 1900, p. 620.

Fallacies as regards ventilation. Calculation of amount of air required. Tables showing amount to be supplied in different classes of buildings.

Nussbaum, H. C. Die Rauchbelästigung in deutschen Städten. *Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4, p. 563.

The paper deals with the smoke and soot nuisance in German towns, and reports the result of a systematic inquiry in 250 towns with over 15,000 inhabitants.

Rubner und Kirchner. Gutachten der wissenschaftlichen Deputation für das Medicinalwesen über den zulässigen Wärmegrad der in Ranalisirten Orten abzuleitenden Fabrikwässer. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 126.

This is an interesting report of the medical council of the Prussian Government on the temperature of liquids discharged into public sewers. The authors are of opinion that as a rule a temperature of 37° C., or 98·6° F., should not be exceeded.

Schmidtmann, Dr. Rückblick auf den Stand der Städte Assanirung im verflossenen Jahr, ins besonden der Abwässer Reinigung, und Ausblick in die voraussichtliche Weiterentwickelung. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 296.

This is a summary of the work done in Germany in 1899 in the matter of town drainage, and especially in the matter of sewage purification, to which is added a forecast of the future development of these questions.

Schmidtmann and two others. Bericht über den Abbruch der Gross Lichterfelder Versuchs Reinigungsanlage für städtische Spüljauche und die hierbei gemachten Beobachtungen. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 288.

This is a report by a commission of experts on the observations made by them when an installation on the septic tank principle was taken down, which had been at work for some time at Gross-Lichterfelde, near Berlin. It deals especially with the sludge question.

Schmidtmann and five others. Bericht über die seitens der Sachverständigen Commission an der Versuchs Kläranlage für städtische Abwässer in Charlottenburg angestellten Versuche. *Vierteljahrsschrift f. gerichtliche Medicin und Sanitätswesen*, Supplement, 1900, p. 262.

This is an interesting report by a commission of experts consisting of medical men, chemists and botanists, on the experiments carried out at Charlottenburg, near Berlin, with the purification of sewage in contact or oxydation beds.

Scobie, H. T. The Bacterial treatment of sewage. *The Surveyor*, Feb. 23rd, 1900, p. 204.

The Manchester experiments. Methods of working and automatic gear. Cost. General considerations. The future.

Vermeule, C. C. New Jersey Forests and their relation to water supply. *The Engineering Record*, July 7th, 1900, p. 8.

The influence of vegetation and trees upon water supply: showing that their influence in checking evaporation is very small, and that the principal effects of forests are (1) to cause a greater permanence of the spring, and (2) to cause a more equable flow.

Will, J. **Shiress**, Q.C. Underground water. *The Surveyor*, March 16th, 1900, pp. 294–5.

The law relating to ownership of underground water. Important cases considered. Pollution of wells. Question of support. Landowners opposition to Bills affecting underground water.

Woodhead, G. **Sims**, M.A.; **Ware**, W. J., Mem.B.A. Water Engineers. Disinfection of water-mains. *Building News*, April 6th, 1900, p. 469.

The Maidstone water supply. Sterilization of the water mains. Description of process employed. Only instance of disinfection of mains on a large scale.

Heating, Lighting, and Ventilating.

O'Gorman, Mervyn. Ventilation of large buildings. *The Surveyor*, April 20th, 1900, Supplement.

Difficulties in regard to ventilating and warming churches, theatres, &c. Amount of air required per individual. Microbes in air. An ideal ventilation.

Woodbridge, Professor S. Homer. Upward versus downward ventilation. *The Building News*. March 30th, 1900, p. 434.

Report on Ventilation of the Capitol, Washington (abstracts of the report).

Woodbridge, Professor S. Homer. Warming and ventilation of mills. *The Engineering Record*, May 5th, 1900, p. 427.

Comparative advantages of water, steam, and air for heating mills.

Personal and Domestic Hygiene.

Beck, Prof. Dr. M. Experimentelle Beiträge zur Untersuchung über die Marktmilch. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 3, p. 430.

The paper deals first with pathogenic germs found in milk in Berlin, which was on sale in the markets; it then deals with their destruction through boiling; and finally recommends earthen vessels for boiling the milk in.

Helm, W. Gewinnung und Absatz von frischer tuberkelbacillen freier Trinkmilch (Eismilch). *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd, XXXII., Heft 3, p. 446.

The author suggests a new method of treating milk previous to its sale, by which it is pasteurised, cooled and kept in fresh condition for some time.

Richmond, H. Droop. The Composition of Milk and Milk Products. *The Analyst*, Sept. 1900, p. 225.

Observations on 34,943 samples of milk and butter analysed in the Aylesbury Dairy Company's Laboratory during 1899.

Schoenstadt, Dr. A. Ueber vegetarische Ernährung und ihre Zulässigkeit in geschlossenen Austalten und bei Menschen, welche sich in einem Zwangsverhältniss befinden. *Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4, p. 597.

The author carefully examines the principles underlying vegetarianism and comes to the conclusion that the contention of vegetarians as to vegetable food being the natural food of man is not tenable, and that vegetarian food ought not to be given in institutions, prisons and other similar establishments.

WULFERT, Dr. Einiges über Ziele und Aufgaben der Berliner Gesellschaft abstinenter Aerzte. *Deutsche Vierteljahrsschrift f. öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4, p. 624.

The author describes the aims of the Berlin society of abstaining medical men, and enumerates some proposals to reduce the excessive use of alcohol.

REVIEWS OF BOOKS.

HOUSES FOR THE WORKING CLASSES IN URBAN DISTRICTS.*

The full title of this volume is "Houses for the Working Classes in Urban Districts, comprising 30 typical and improved plans arranged in groups with elevations for each, and block plans, etc."

The chapters into which it is divided are Introduction, Disposition and external treatment of small houses, General remarks on planning, Detailed remarks on plans, Detailed remarks on elevation, etc., and a long Table giving sizes of rooms, cubic contents, cost, etc., etc., twenty pages of plates, and concluding with an Appendix containing an Abstract from the Local Government Board's Model Bye-Laws and the London County Council's Bye-Laws.

It is a noteworthy production and deserves a detailed review. The large frontispiece double-page plate in perspective gives the key-note to the work, and shows the various types of dwelling houses arranged in terraces on the outskirts of a town, and is typically suburban rather than urban.

The expression urban in the title has doubtless been used because districts popularly known as "suburban" are technically included in local government nomenclature as "Urban Districts." One may venture to suggest that the demand for this opportune work might have been increased by the substitution in the title of the word "Suburban" for that of "Urban."

That the authors intend to confine their attention to "small houses in suburban districts" is so stated in the introduction. It is important that this should be borne in mind, as it is in the suburbs that those forms of construction can be avoided that exclude the free circulation of external air—forms from which it is often difficult to escape in the central parts of towns.

It is suggested that the back spaces of a terrace of small houses might be thrown into one large open space for common use and as a playground for children, much in the same manner as the space attached to blocks of tenements is laid out, and that the production of a pleasing elevation is marred for architects by the requirement of the Local Government Board that the party walls must be carried through the roof, adding also to the difficulty and expense of making the roofs water-tight. The Local Government Board regard it as more important to keep out fire than water, and bye-laws do not provide for artistic design. Nevertheless, Messrs. Cranfield and Potter have succeeded in producing some eight elevations, the majority of which are decidedly pleasing and several are even picturesque, considering how closely economy requires to be studied in this class of house.

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* By S. W. Cranfield, A.R.I.B.A., and H. J. Potter, A.R.I.B.A. London, *B. T. Batsford*, 1900. Imperial 4to, 33 pp. and 21 Plates. Price 15/-

In planning, economy has been so closely observed that the area of single bedrooms in some instances falls below 50 square feet. It is but fair to say that this only applies to the third bedroom in some of the houses provided with three bedrooms in addition to parlour and living room, and that the authors claim to have paid special regard to the position of door, window, fireplace and bed, although these particular rooms do not appear to possess any fireplaces. The large majority of the rooms are of fair proportion, from 100 to 150 square feet in area, the generally recognised size for this class of house.

In looking at the block plans one recognises that the most reasonable and convenient method of providing the appurtenances of a dwelling, such as scullery, lobby, w.c., etc., is by attaching them to the house as an addition or outbuilding to the main structure, and provided that the addition does not obstruct the circulation of air no exception can be taken to it. But, when the projection of the addition from the main rear wall is greater than the distance from one addition to another, so as to form an elongated rectangular well between the additions upon the rear fronts of the houses, then exception must be taken to this obstruction to natural air currents. When in the rectangular well space w.c.'s are erected, the perflation is further obstructed, and when habitable rooms take the place of the w.c.'s in the addition or outbuilding, it is time to remark that the crowding of persons into rooms in towns is not remedied by the crowding of rooms into houses in the suburbs. This is carried to its utmost in plans H, 1 and 2, where three rooms are built out in additions at the rear by a *back-to-back* method of construction. Without desiring to be hypercritical it is sincerely to be hoped that the authors will allow that portion of their otherwise praiseworthy production to be modified so as to be acceptable not only to architects and intending builders but also to sanitarians.

Reviewing the work as a whole the authors must be highly commended for their courage in venturing upon the thorny and disputative phase of reducing to practical architectural construction some of the theoretical methods suggested for housing the working classes, and for supplying a long wanted text book with drawings, subject to the exceptions mentioned. J. F. J. S.

MEETINGS HELD JUNE TO SEPTEMBER, 1900.

CONFERENCE ON THE HOUSING OF THE WORKING CLASSES.

The Conference took place on July 30th and 31st. Discussions were held in the mornings, and the afternoons were devoted to the exhibition of plans and models in the Parkes Museum, and to visits to improved areas and dwellings. Delegates were officially appointed to attend the Conference, representing 112 Sanitary authorities. Full report of the Conference is given on pp. 382—452.

In consequence of the large number of Delegates the meetings were arranged in the Lecture Room of the Royal Medical and Chirurgical Society.

The exhibition in the Parkes Museum consisted of Plans and Models illustrating nearly all classes of artizans' dwellings, and the Council desire to thank the following gentlemen, Authorities, &c., who so kindly lent Plans and Models for this purpose.

A. H. Campbell, Assoc.M.Inst.C.E., Engineer and Surveyor, East Ham.
R. Langton Cole.
H. H. Collins, F.R.I.B.A.
Clare and Ross.
Sydney W. Cranfield, A.R.I.B.A., & Henry J. Potter, A.R.I.B.A.
Thomas W. Cutler, F.R.I.B.A.
Davies & Emmanuel.
Henry W. Dobb, M.S.A.
W. Goldstraw, Building Surveyor, Liverpool.
Glasgow Office of Public Works.
C. J. Hair, A.R.I.B.A.
E. T. Hall, F.R.I.B.A.
Hornsey District Council (E. J. Lovegrove, M.Inst.C.E., Engineer and Surveyor, Hornsey District Council).
Hull, Corporation of.
Joseph, Son & Smithem, Architects to the Guinness Trust.
Leeds Town Council.
Liverpool, City of.
London County Council.
Mervyn Macartney, M.A.
Manchester City (T. de Courcy Meade, M.Inst.C.E., City Surveyor, Manchester).
J. Douglass Mathews, F.R.I.B.A.
Metropolitan Association for Improving the Dwellings of the Industrial Classes.
A. Moore, Improved Dwellings Company.

James Munce, Assoc.M.Inst.C.E., Assistant City Surveyor, Belfast.
Richmond, Borough of.
Spalding & Spalding, F. & A.R.I.B.A.
W. **Towers**, Inspector of Buildings, Leeds.
W. E. **Wallis**, A.R.I.B.A., Surveyor to Peabody Donation Fund.
W. **Woodward**, A.R.I.B.A., F.S.I.

By the courtesy of the London County Council visits were arranged to the Dwellings erected on the Millbank Estate, Westminster, and on the Boundary Street Area, Bethnal Green. The Members were conducted over the Buildings by a representative from the Valuer's and Architect's Department.

By the courtesy of the Richmond Town Council a visit was arranged to the Artizans' Dwellings erected by the Council. The **Mayor** received the Members, and afterwards kindly invited those attending to Tea at Asgill House, Richmond. Mr. J. H. **Brierley**, the Borough Surveyor, conducted the Members over the Dwellings.

MEETING OF THE INSTITUTE IN PARIS.

A **Meeting** was held in Paris, in conjunction with the Société Française d'Hygiène, on August 7th, 8th, and 9th.

The Members and Associates of the Institute travelled to Paris on August 6th, and were received on their arrival at the Station by Dr. Foveaux de Courmelles and the Reception Committee of the French Society.

The meetings were held in the Museum of the Jardin des Plantes. On the first day addresses were given by M. le Prof. Gréhant, with demonstrative experiments on his researches and discoveries of alcohol and carbon monoxide in the blood, and by Prof. W. H. Corfield, the President of the meeting. (These addresses are reported on pages 462 and 463).

The Wednesday and Thursday were devoted to Conferences of Medical Officers of Health, Municipal Engineers, and Sanitary Inspectors. (An account of these is given on pages 471, 483, 503).

Visits were made under the guidance of the heads of different departments to the Exhibits relating to the Municipal and Sanitary Administration of Paris, and to the Exhibits of the Pasteur Institute. The Members also went along the sewers of Paris and over the Sewage Farm at Gennevilliers.

About seventy Members and Associates attended the meeting, and delegates were appointed by the Local Government

Board for Ireland, the Corporations of Belfast, Carlisle, Nottingham, Wolverhampton, and other Sanitary Authorities.

At the conclusion of the meeting the following Resolutions were unanimously passed:—

1. "That the hearty thanks of The Sanitary Institute are due and hereby presented to M. le Prof. Gréhant, President, Dr. Ladriet de Lacharriére, Vice-President, M. Joltrain, Secretary, and the Members of the Société Française d'Hygiène for the cordial and hospitable welcome extended to the Members of the Institute."

2. "That the sincere thanks of the meeting are due to M. le Prof. Edmond Perrier for having courteously granted the use of handsome and suitable rooms for the meeting."

3. "That the earnest thanks of the Members are due to M. Bechmann, M. Masson, M. Bertillon, M. Launay, and other representatives of departments, for the interesting demonstrations of the exhibits in the Pavillon de la Ville de Paris and the visits to the works in the city."

4. "That the cordial thanks of the Members are due to the Reception Committee for their kind assistance in receiving and looking after the Members during the meeting."

5. "That the Institute and the Members present desire to express to the Honorary Secretaries, Dr. Foveau de Courmelles, Mr. C. Nicholson, Dr. Blayac, and M. Joseph de Pietra Santa, their sincere thanks for the arrangements made for the organisation of the meeting which has been so successfully and pleasantly carried through."

EXAMINATIONS.

From June to September the following Examinations were held:—

Practical Sanitary Science.

July 6th and 7th, Cardiff. One Candidate presented himself.

July 20th and 21st, Liverpool. 7 Candidates, 5 Certificates granted.

Inspectors of Nuisances.

July 6th and 7th, Cardiff. 21 Candidates, 14 Certificates granted.

July 20th & 21st, Liverpool. 58 Candidates, 30 Certificates granted.

Inspectors of Meat and Other Foods.

July 27th & 28th, Liverpool. 6 Candidates, 5 Certificates granted.

The following lists give the names of the Candidates to whom Certificates were granted:—

Practical Sanitary Science.

1900, July 21.	Chapman, Matthew.
1900, July 21.	Greenwood, James.
1900, July 21.	Holmes, Reuben.
1900, July 21.	Leigh, Arthur Graham.
1900, July 21.	Wilkinson, Frank.

Inspectors of Nuisances.

1900, July 21.	Allen, James.
1900, July 21.	Ashton, John.
1900, July 21.	Bailey, George Frederick.
1900, July 21.	Beard, Walter.
1900, July 21.	Cartwright, William.
1900, July 21.	Chard, Alfred Horace.
1900, July 7.	Clarke, Albert Charles John.
1900, July 7.	Davies, Rhys John.
1900, July 7.	Davies, Richard Jeffreys.
1900, July 21.	Doughty, James.
1900, July 7.	Dyer, John.
1900, July 7.	Fowles, George Frederick.
1900, July 7.	Grabham, Richard.
1900, July 21.	Haigh, Tom Vickernon.
1900, July 21.	Hall, Joseph Thomas Holt.
1900, July 21.	Hampton, David William.
1900, July 21.	Holden, Bernard Joseph Grattan.
1900, July 21.	Jones, Sandford.
1900, July 21.	Kilner, Edward.
1900, July 7.	Lewis, Benjamin.
1900, July 21.	Lindsay, James Moir.
1900, July 21.	Lord, John Ernest.
1900, July 21.	Makin, William Edwin.
1900, July 21.	McKenn, Robert John.
1900, July 21.	Openshaw, William Pilling.
1900, July 21.	Palmer, Joseph Buckley, Jr.
1900, July 21. *L*	Petrie, Miss Agnes Grant.
1900, July 21.	Porter, Frederick.
1900, July 7.	Powell, William James.
1900, July 21.	Rae, James.
1900, July 7.	Rhoderick, Moses.
1900, July 21.	Roberts, Mortimer Nicholas Haly.
1900, July 7.	Savery, Frederick.
1900, July 21.	Skillicorn, Edward Richards.
1900, July 21.	Skimmin, Christopher Robert.
1900, July 21.	Smedley, John Ames.

1900, July 21.	Smith, Ernest.
1900, July 21.	Smith, George.
1900, July 7.	Sunderland, Charlie Harker.
1900, July 21.	Toole, Michael.
1900, July 7.	Walsh, George.
1900, July 21.	Wilkinson, Harry.
1900, July 7.	Williams, Philip.
1900, July 7.	Wright, Walter.

Inspectors of Meat and Other Foods.

1900, July 28.	Baxter, James Anderson.
1900, July 28.	Hoey, William.
1900, July 28.	Pickering, Thomas Farmer.
1900, July 28.	Lee, James.
1900, July 28.	Raistrick, Harry.

Examination Questions.

Practical Sanitary Science.—Cardiff, July 6th & 7th, 1900.

1. Describe the wet and dry bulb hygrometer. Explain how it is used to calculate the degree of humidity of the atmosphere. What is the *elastic force* of *vapour*, and how is it determined?
2. What are the advantages of a hilly or undulating site for a building as compared with a plain, and what precautions would you take to secure a healthy site in building a house (1) on the side of a hill with stiff clay subsoil; (2) on made ground?
3. How does the nature of a subsoil influence disease propagation? Discuss this question with reference to some of the more important diseases.
4. Define the chief sources of water supply, and give the advantages or otherwise of each.
5. Describe and illustrate by sketches the various kinds of fireproof floors that you are acquainted with.
6. Explain fully two methods of warming and ventilating a school class-room 25 ft. by 22 ft. and 12 ft. high, to maintain a temperature of 60° Fah. when the outside temperature is at freezing point.
7. A system of sewers having to be designed for several detached villages, give the calculations which would determine the volumes to be provided for on the "separate" system.
8. Describe, with sketch, a good kind of refuse destructor for town refuse, and say what you know as to the temperature which should be maintained, to what uses the heat may be applied, and to what purposes the by-product of clinker may be put.

The Candidates were examined vivâ voce *on the 7th.*

Practical Sanitary Science.—Liverpool, July 20th and 21st, 1900.

1. What causes the pressure of water in a pipe leading from an open cistern? How is the pressure (*a*) calculated; (*b*) measured.

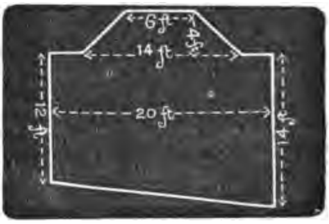
2. Give examples of porous and of impermeable soils. How are they affected by subsoil water, and which is the healthier to build upon?

3. What do you consider an unhealthy ground water-level for a building site, and why is a fluctuating ground water-level more unhealthy than a permanently high one? Explain under what conditions a sand and gravel site may be undesirable and unhealthy.

4. Give a list of the material used for roof coverings, and the advantages or disadvantages of each kind, and the weight and method of fixing each kind.

5. Describe and illustrate by sketches the various ways of building hollow walls; the wall ties used; how the damp course is placed; and what precautions are taken when girders or lintels occur in hollow walls.

6. Give the cubical contents of a rectangular room 40 ft. long, 30 ft. wide, and 15 ft. high, having an 18 ft. circular opening in ceiling 6 ft. high, upon which is imposed a hemispherical dome also 18 ft. in diameter.



7. What is the greatest velocity of air movement which will not cause inconvenience to the occupants of a room? Describe fully any method by which air movement of this kind can be maintained in a room under ordinary conditions. Illustrate by sketches.

8. A country house (with the usual stabling, offices, &c., adjoining) is to be sold subject to your reporting that the sanitation is satisfactory, describe how you would carry out an inspection.

The Candidates were examined vivâ voce *on the* 21*st.*

Inspectors of Nuisances.—Cardiff, July 6th and 7th, 1900.

1. Define the following expressions used in the Sale of Food and Drugs Act, 1899:—(*a*) "Food"; (*b*) "Margarine Cheese"; (*c*) "Cheese." What are the requirements of the Act respecting the sale by retail of margarine cheese?

2. What legal provisions have been framed against overcrowding? What powers exist to deal with the evil?

3. Indicate the various precautions against the spread of infection which should be taken when a person suffering from typhoid fever is nursed at home.

4. A row of six houses has an intermittent service of water from public mains, which is suspected as being the cause of an outbreak of typhoid fever in three of the houses. What procedure should be followed in order to ascertain whether the suspicion was justified?

5. How may a shallow well be polluted, and what measures should be taken to preserve the well from contamination?

6. What is understood by (*a*) Mechanical Ventilation; (*b*) Natural Ventilation? In what class of buildings do you consider mechanical ventilation desirable? Describe the methods usually adopted in the ventilation of large buildings.

7. What are the points to which special attention should be directed in determining whether new drains have been properly laid? Describe in detail a good method of testing such drains.

8. State your opinion, favourable or otherwise, regarding the following types of water-closets, giving your reasons in each case:—
(*a*) Wash-out; (*b*) Wash-down; (*c*) Pan; and (*d*) Valve.

and Drugs Acts note when purchasing a sample for analysis? Describe the procedure to be adopted when that article is purchased, and the subsequent action required to be taken by him under the Acts.

3. Explain how nuisances may arise in the process of brick burning, and explain how these may be prevented.

4. Enumerate, shortly, the dangers which are likely to arise if house refuse and excreta are allowed to accumulate on premises, and indicate what precautions should be taken, as regards the premises and receptacles, so as to minimize the danger as far as possible.

5. What precautions are necessary to prevent dampness in a building erected on a clay soil?

6. In a room of 1,000 cubic feet capacity, the air enters at an opening, one square foot in sectional area, at the rate of 3 feet per second; in another room, of 4,500 cubic feet capacity, the air enters at a similar opening at the rate of 2½ feet per second; show which room has received, at the end of two hours, the greatest amount of fresh air in proportion to its capacity.

7. Describe the several valves and taps used in distribution of a water supply. Explain the advantages and use of each.

8. Show by means of sketches various types of house and drain traps which are met with, indicating in each case the good and bad points in the respective types.

The Candidates were examined vivâ voce *on the* 21*st.*

Inspectors of Meat and other Foods.—Liverpool, July 27th and 28th, 1900.

(Only eight of the questions to be answered.)

1. Give the substance of the several legal enactments intended to provide against the sale of unsound or unwholesome foods.

2. In what parts of the carcase of the ox would you look for tuberculosis? By what signs may the disease be recognised in different parts of the carcase, and in different forms and stages of its development, &c.?

3. What parasitic worms may be found in the flesh of the ox and pig; and which of these are liable to produce disease in man? Describe the appearances by which you would recognise the presence of these parasites. What animals are most subject to parasitic disease?

4. What test would you apply for the purpose of discovering the unsoundness of meat when in the carcase or otherwise?

5. Describe the normal condition of the lungs, liver, and kidneys of an ox, sheep, and pig.

6. What appearances would you expect to find in the lungs of an ox—

(*a*) That had been bled to death;
(*b*) That had been bled shortly after death;
(*c*) That had not been bled at all, but had lain on one side for some hours after death?

7. How would you distinguish the carcase of a rabbit from that of a cat?

8. Describe, with sketch, the structure and drainage of a model slaughter-house.

9. What method of killing cattle, sheep, &c., do you consider the most effective; and what do you consider the best system of storage for the preservation of the carcases after being dressed?

10. What preservatives are added to ordinary articles of food and drink? Which of them do you consider injurious, and in what amounts?

The Candidates were examined vivâ voce *on the* 28*th.*

FORTHCOMING MEETINGS.

CALENDAR, SEPTEMBER TO DECEMBER, 1900.

As far as at present arranged.

Council Meetings are held Monthly on the Second Wednesday in each Month at 5 p.m., except August and September.

Special Purposes Committee	Third Monday at 5 p.m.
Finance Committee	Second Wednesday at 4.30 p.m.
Exhibition Committee	First Monday at 5 p.m.
Congress and Editing Committee	Second Monday at 5 p.m.
Museum and Library Committee	Fourth Monday at 5 p.m. (except December).
Examination Committee	Fourth Friday in October, 6 p.m.
Parliamentary Committee	As occasion requires.
Rivers Pollution Committee	
Meat Inspectors Exam. Committee	

SEPTEMBER.

LECTURES TO SANITARY OFFICERS AT 8 P.M.

17 M.	Mechanical Physics; Laws of Motion, Hydraulics, &c.	John Castell-Evans, F.I.C., Lecturer on InorganicChemistry & Chemical Physics at the City & Guilds of London Technical College, Finsbury.
19 W.	Natural Forces; Light, Heat, Electricity; Chemistry.	
21 F.	The Atmosphere; Pressure and Composition; Air; Combustion and Respiration.	
24 M.	Ventilation, Warming, and Lighting.	
26 W.	Meteorology.	

26 W. Inspection and Demonstration in the Parish of St. George's, Hanover Square, at 2 p.m. (number limited), conducted by Albert Taylor, Chief Sanitary Inspector.

28 F.	Lecture to Sanitary Officers at 8 p.m. Sanitary Law, A: Introductory Remarks, Public Health Acts—English, Scotch, Irish; other Statutes relating to Public Health; By-Laws (Models, etc.), Regulations, Orders, Memoranda, etc.	J.Priestley, B.A., M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

29 S. Inspection and Demonstration at Wimbledon Sewage Works, at 3 p.m., conducted by C. H. Cooper, M.INST.C.E., Engineer and Surveyor to District Council.

OCTOBER.

3 W.	Lecture to Sanitary Officers at 8 p.m. Sanitary Law, B: Public Health London Act; Metropolis Local Management Acts; By-Laws and Regulations in Force in the Administrative County of London.	J.Priestley, B.A., M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

3 W. Inspection and Demonstration of Disinfecting Apparatus and Model Steam Laundry at St. John's Wharf, Fulham, at 3.30 p.m., conducted by W. G. Lacy.

4 T. Lecture to Sanitary Officers at 8 p.m. Sanitary Law. C: Factory and Workshop Acts (including Bakehouse Legislation) 1878–95, as they affect the Sanitary Inspector; Smoke Legislation, Food and Drugs Act, 1899.
5 F. Lecture to Sanitary Officers at 8 p.m. Duties of a Sanitary Inspector—General, A: Outdoor.
J. Priestley, B.A., M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

6 S. Inspection and Demonstration at Morden Hall Dairy Farm, Morden, Surrey, at 3 p.m.

8 M. Lecture to Sanitary Officers at 8 p.m. Duties of a Sanitary Inspector—General, B: Indoor.
10 W. Lecture to Sanitary Officers at 8 p.m. Duties of a Sanitary Inspector—C: Offensive Trades and Trade Nuisances, &c.
J. Priestley, B.A., M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

10 W. Inspection and Demonstration at John Knight & Sons' Soap Works, Silvertown, at 3 p.m.

11 Th. Demonstration of Book-keeping as carried out in a Sanitary Inspector's Office, in the Parkes Museum, at 8 p.m., by Albert Taylor, Chief Sanitary Inspector, St. George's, Hanover Square.

12 F. Lecture to Sanitary Officers at 8 p.m. Infectious Diseases, by Henry R. Kenwood, M.B., D.P.H., F.C.S., Asst. Professor of Hygiene, University College, Med. Officer of Health, Stoke Newington.

13 S. Inspection and Demonstration at the Southwark and Vauxhall Water Works, Hampton, at about 3 p.m.

15 M. Lecture to Sanitary Officers at 8 p.m. Methods of Disinfection.
17 W. Lecture to Sanitary Officers at 8 p.m. Water: Composition, Pollution, and Purification.
Henry R. Kenwood, M.B., D.P.H., F.C.S.

17 W. Inspection and Demonstration at Common Lodging House.

19 F. Lecture to Sanitary Officers at 8 p.m. Elementary Statistics, by Henry R. Kenwood, M.B., D.P.H., F.C.S.

20 S. Inspection and Demonstration at the Leyton Sewage and Destructor Works, at 3 p.m., conducted by Wm. Dawson, M.INST.C.E., Engineer and Surveyor to District Council.

23 Tu. Lecture to Sanitary Officers at 8 p.m. Details of Plumbers' Work.
24 W. Lecture to Sanitary Officers at 8 p.m. Sanitary Appliances.
J. Wright Clarke.

24 W. Inspection and Demonstration in the Parish of St. George's, Hanover Square, at 2 p.m. (number limited), conducted by Albert Taylor, Chief Sanitary Inspector.

26 F. Lecture to Sanitary Officers at 8 p.m. Building Materials, by H. D. Searles Wood, F.R.I.B.A.

27 S. Inspection and Demonstration at the Aylesbury Dairy Company's premises, St. Petersburgh Place, Bayswater, at 3 p.m.

29 M. Lecture to Sanitary Officers at 8 p.m. Sanitary Building Construction and Planning; Soil and Local Physical Conditions, by H. D. Searles Wood, F.R.I.B.A.

31 W. Lecture to Sanitary Officers at 8 p.m. Calculations, Measurements, and Plans and Sections, by W. C. Tyndale, M.INST.C.E.

NOVEMBER.

2 F. Lecture to Sanitary Officers at 8 p.m. House Drainage, by W. C. Tyndale, M.INST.C.E.

3 S. Inspection and Demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m., conducted by Charles Jones, M.INST.C.E., Engineer and Surveyor to the District Council.

6 Tu.	Lecture to Sanitary Officers at 8 p.m. Water Supply, Sources of Supply and Distribution.	Prof. Henry Robinson, M.INST.C.E.
8 Th.	Lecture to Sanitary Officers at 8 p.m. Sewerage.	
9 F. 10 S.	Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Newcastle-upon-Tyne.	
13 Tu.	Lecture to Sanitary Officers at 8 p.m. Sewage Disposal.	Prof. Henry Robinson, M.INST.C.E.
15 Th.	Lecture to Sanitary Officers at 8 p.m. Scavenging, Disposal of House Refuse.	
14 W.	Lecture to Sanitary Officers at 8 p.m. Signs of Health and Disease in Animals destined for Food, when alive and after slaughter; Tuberculin and other Tests.	W. Hunting, F.R.C.V.S.
16 F.	Lecture to Sanitary Officers at 8 p.m. The Names and Situations of the Organs of the Body in Animals.	
17 S.	Inspection and Demonstration at Harrison & Barber's Knacker Yard, Winthrop Street, Whitechapel, E., at 3 p.m.	
19 M.	Lecture to Sanitary Officers at 8 p.m. Practical Methods of Stalling and Slaughtering Animals, by W. Hunting, F.R.C.V.S.	
22 T.	Lecture to Sanitary Officers at 8 p.m. Diseased Meat, with a Demonstration of Morbid Specimens collected from Meat Markets, by James King, M.R.C.V.S., Veterinary Inspector, Metropolitan Cattle Market.	
23 F.	Lecture to Sanitary Officers at 8 p.m. The Appearance and Character of Fresh Meat, Organs, Fat, Blood, Fish, Poultry, Milk, Fruit, Vegetables, and other food, and the conditions rendering them, or preparations of them, fit or unfit for human consumption, Preserving and Storing Meat and other Foods.	E. Petronell Manby, B.A., M.D., D.P.H., Medical Inspector Local Government Board.
26 M.	Lecture to Sanitary Officers at 8 p.m. The Hygiene of Byres, Lairs, Cow Sheds, and Slaughter Houses, and all places where animals destined for the supply of food are kept, and the Hygiene of Markets, Dairies, and other places where food is stored, prepared, or exposed for sale, and transported.	
27 Tu.	Inspection and Demonstration at the Metropolitan Cattle Market, York Road, N., conducted by James King, M.R.C.V.S., Veterinary Inspector, Metropolitan Cattle Market.	
28 W.	Lecture to Sanitary Officers at 8 p.m. The Laws, By-Laws, and Regulations affecting the Inspection and Sale of Meat and other articles of food, including their preparation and adulteration, by E. Petronell Manby, B.A., M.D., D.P.H.	
30 F.	Examination in Practical Sanitary Science and for Inspectors of Nuisances, London.	

DECEMBER.

1 S.	Examination in Practical Sanitary Science and for Inspectors of Nuisances, London.
7 F. 8 S.	Examination for Inspectors of Meat and other Foods.
12 W.	**Sessional Meeting.**
14 F. 15 S.	Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Manchester.
21 F. 22 S.	Examinations in Practical Sanitary Science and for Inspectors of Nuisances in Sydney, N. S. W.

AUSTRALIAN EXAMINATION.

Examinations in Practical Sanitary Science are held by the Institute in Sydney, New South Wales.

A Local Board of Examiners has been appointed for conducting the Examinations. The regulations and syllabus of the Examinations are practically the same as in Great Britain, except that the fee at present fixed is £2 2s.

The dates proposed for the Examination in Sydney in 1900, are December 21st and 22nd.

DATES AND PLACES ARRANGED FOR EXAMINATIONS IN 1901.

IN PRACTICAL SANITARY SCIENCE AND FOR INSPECTORS OF NUISANCES.

Under the Public Health Act, 1875.

Bristol	January 25th and 26th.
Edinburgh	March 8th and 9th.
Birmingham	March 22nd and 23rd.
London	April 26th and 27th.
Dublin	June 7th and 8th.
Bradford	June 28th and 29th.
Liverpool	July 12th and 13th.
Cardiff	July 26th and 27th.
Norwich	November 1st and 2nd.
Newcastle	November 15th and 16th.
London	November 29th and 30th.
Manchester	December 20th and 21st.

FOR INSPECTORS OF MEAT AND OTHER FOODS.

Birmingham	March 29th and 30th.
London	May 3rd and 4th.
Liverpool	July 19th and 20th.
London	December 6th and 7th.

IN PRACTICAL HYGIENE FOR SCHOOL TEACHERS.

London	February 8th and 9th.
Bradford	June 28th and 29th.

FELLOW, MEMBERS, & ASSOCIATES ELECTED.

JULY, 1900.

(A complete list of Fellows and Members can be had on application.)

FELLOW.

1273 1900. July. WALDO, F. J., M.A., M.D., M.R.C.S., D.P.H., 1. *Plowden Buildings, Temple, E.C.*

MEMBERS.

*** Passed Examination for Practical Sanitary Science.**
† Passed Examination for Local Surveyors.
‡ Passed Examination for Inspector of Nuisances.

1410 1900. July. BALL, Frederick, 8, *Chester Road, Southwold.*
1411 1900. July. †CAMPBELL, Adam Horsburgh, ASSOC.M.INST.C.E., *East Ham.*
1412 1900. July. ‡DICKINSON, Arthur James, *Borough Engineer, Pwllheli, Sandilands, Pwllheli.*
1413 1900. July. FLEMING, Michael J., *Borough Surveyor, Waterford.*
1414 1900. July. GLASS, Sydney Newton, ASSOC.M.INST.C.E., *Town Hall, Woolwich, S.E.*
1415 1900. July. HAWKINS, Thomas Shirley, ASSOC.M.INST.C.E., *Cottonworth, Stafford Road, Shirley, Southampton.*
1416 1900. July. KILLICK, Peter Gorringe, 15, *Amwell St., Myddelton Square, Clerkenwell, E.C.*
1417 1900. July. ‡LOCKE, William Richard, *Borough Surveyor, R.D.C., Hemel Hempstead.*
1418 1900. July. ‡MAGER, Frederick Walter, *Surveyor, R.D.C., Walsall.*
1419 1900. July. PALMER, William Lowell Francis, *Tamer House, Priory Road, Upper Knowle, Bristol.*
1420 1900. July. PHIPPS-CAREY, Major-General Constantine, *Local Government Board, Whitehall, S.W.*
1421 1900. July. PRESCOTT, William Henry, *Borough Engineer and Surveyor, Reigate.*
1422 1900. July. RICHARDSON, Harry, ASSOC.M.INST.C.E., *The Council Office, Handsworth.*
1423 1900. July. *SAUNDERS, John Samuel, 8, *Stuart Road, Thornton Heath.*
1424 1900. July. SMITH, Thomas Reader, ASSOC.M.INST.C.E., *Surveyor, Urban District Council, Kettering, Northampton.*
1425 1900. July. VIDEAN, Henry, *Assistant and Deputy Borough Engineer, Folkestone.*

1436 1900. July. Watson, John Duncan, ASSOC.M.INST.C.E., *Engineer to Birmingham Tame and Rea District Drainage Board, Tyburn, near Birmingham.*

1437 1900. July. ‡Young, William Percy, *Engineer and Surveyor, Hoyland Nether U.D.C.*

ASSOCIATES.

‡ Passed Examination for Inspectors of Nuisances.

2121 1900. July. ‡Bullock, Charles Gray, 9, *Cromwell Road, Camberley.*

2122 1900. July. ‡Brown, Frank Charles, 4, *Limes Road, Croydon.*

2123 1900. July. ‡Cann, Miss Ethel Southern, 63, *Fernhead Road, Paddington, W.*

2124 1900. July. ‡Chapman, Charles William, *Ellerslie Bridge Road, Pear Tree Green, Southampton.*

2125 1900. July. ‡Chancellor, W. B., *Town Hall, Leek.*

2126 1900. July. ‡Cobbett, Frederick George, 3, *The Cottages, Royal Naval Hospital, Haslar, Gosport.*

2127 1900. July. ‡Deverill, Frank Thomas, 74, *Hencroft Street, Slough.*

2128 1900. July. ‡Furnivall, Albert James, *Glencore, Muswell Hill, N.*

2129 1900. July. ‡Griffiths, Arthur, 7, *Westbourne Park Villas, W.*

2130 1900. July. ‡Griffiths, Frank, *Claremont, Holden Road, Blundellsands.*

2131 1900. July. ‡Hayter, Arthur Ernest, *Pennington, Lymington.*

2132 1900. July. ‡James, Robert Ernest, 9, *Bassein Park Road, Shepherd's Bush, W.*

2133 1900. July. ‡Keeley, Robert, 20, *Caroline Street, Seaham Harbour.*

2134 1900. July. ‡Latham, Harry Gould, 2B, *Wincott Street, Kennington Road, S.E.*

2135 1900. July. ‡Mason, George William, *Sandside, Warren Drive, New Brighton.*

2136 1900. July. ‡McCleverty, Miss Elise Anne, 87, *Eaton Terrace, S.W.*

2137 1900. July. ‡Negus, Thomas Henry, 32, *Arthur Road, Erdington.*

2138 1900. July. ‡Newberry, Arthur, *Springfield House, Springfield, Upper Clapton, N.E.*

2139 1900. July. ‡Phillips, Francis Jorworth, *Bryn Eirw, Hafod, Pontypridd.*

2140 1900. July. ‡Watson, William, 13, *Penley's Grove Street, York.*

2141 1900. July. ‡Worge, Lewis Edward, *The Hawthorns, Oakleigh Park, N.*

OBITUARY.

HENRY LAW, M.INST.C.E.

(CHAIRMAN OF COUNCIL.)

It is with very sincere regret that the Council have to record the death of their Chairman and much respected Fellow of the Institute, Mr. Henry Law, M.Inst.C.E., who died July 18th last. Mr. Law joined the Institute in 1877, and was elected a Member of the Council in 1878, upon which he remained, taking a most interested and active part in its work until the time of his last illness, during which he anticipated a return to his colleagues, but which terminated fatally, and somewhat unexpectedly, on the above date.

Mr. Law was a leading spirit in the Institute, and for twenty years one of the Board of Examiners for those desiring certificates of competency as Sanitary Officers; also one of the Judges of the Sanitary Exhibition. From 1891 to 1895 he filled the office of Chairman of the Examiners, and from 1895 to 1899 Chairman of the Exhibition Judges, in which position he was largely instrumental in codifying the method of judging and classifying the list of awards. He was elected Chairman of Council in 1899.

Mr. Law was born at Reading in 1824, and articled in 1837 to that eminent engineer of great enterprises, Sir Isambard Brunel, under whom he was engaged on the engineering staff of the Original Thames Tunnel, on which work he remained until its completion in 1843. Subsequently Mr. Law was engaged in taking soundings of the River Thames in connection with a Royal Commission on the Improvement of the Metropolis. In 1844 he became an assistant to Mr. Thomas Page, Consulting Engineer for Woods and Forests, and assisted in the design of various works connected with the Thames, and for two years had charge of the Windsor improvements. Mr. Law left Mr. Page in 1850, and at this time published several works on Engineering and allied subjects, including a Memoir of the Thames Tunnel.

In 1855 Mr. Law went to South America, and carried out various works for the Brazilian Government. Returning to England in 1873, he settled down to practice in London, chiefly in connection with Sanitary works—notably the Oldham Sewerage and the Flood Prevention works at Eastbourne. He was in partnership with Mr. G. Chatterton, M.Inst.C.E., from Feb., 1878, until 1887.

Mr. Law was largely consulted as an expert upon matters relating to the Thames and in Hygienic affairs.

Personally Mr. Law was most courteous and amiable; professionally an able, exact, acute-minded and skilful engineer, who gained the respect of everyone, whether engaged with him or acting professionally in opposition. In the Councils of the Institute his good sense and sound judgment were invaluable, and his colleagues most sincerely regret the loss which they and the Institute have sustained.

L. A.

CONTRIBUTIONS AND ADDITIONS TO LIBRARY

June to September, 1900.

⁂ *For publication of Societies and Institutions, &c., see under "Academies."*

ACADEMIES (American).

Toronto, *Canadian Institute.* Transactions, Semi-Centennial Memorial Volume, 1849–1899. 660 pp., 8vo. Toronto, 1899. *The Institute.*

Winnipeg. *Historical and Scientific Society of Manitoba.* Annual Report for 1899, 24 pp.; The Present Status of Natural Science in Manitoba and the North-west, by the Rev. W. A. Burman, B.D., 23 pp.; On the St. Paul Trail in the Sixties, by W. G. Fonseca, 14 pp. 8vo. Winnipeg, 1900. *The Society.*

ACADEMIES (Australian).

Melbourne. *Australian Health Society.* Infant Feeding, the use and abuse of Artificial Foods. 15 pp., 8vo. Melbourne.

——— Twenty-fourth Annual Report, 1898–9. 16 pp., 8vo. Melbourne, 1900. *The Society.*

Sydney. *Royal Society of New South Wales.* Journal and Proceedings. 227 pp., 8vo. Abstract of Proceedings, 66 pp. Sydney, 1900. *The Society.*

ACADEMIES (British).

Durham, University of. *College of Medicine, Newcastle-upon-Tyne,* Calendar, 1900–1901. 160 pp., 8vo. Newcastle-upon-Tyne, 1900. *The College.*

Hereford. *Woolhope Naturalists' Field Club.* Transactions, 1895, 1896, 1897. 456 pp., 8vo. Hereford, 1898. *H. Cecil Moore, M.D.*

London. *British Association of Waterworks Engineers.* Vol. IV., 1899. 173 pp., 8vo. London, 1900. *The Association.*

——— *Guy's Hospital Medical School.* Calendar, 1900–1901. 92 pp., 8vo. London, 1900. *The School.*

——— *Institution of Civil Engineers.* Minutes of Proceedings, with other Selected and Abstracted Papers. Vol. CXL., 1899–1900, Part II. 435 pp., 8vo. London, 1900.

to by Chalkley Gould & Co.

Henry Law, M. Inst. C. E.

London. *Institution of Civil Engineers.* Minutes of Proceedings, Vol. CXLI., 1899–1900, Part III. 507 pp., 8vo. London, 1900. *The Institution.*

——— *The Institution of Mechanical Engineers.* Proceedings, Jan.—March, 1900. No. 1. 180 pp., 8vo. London, 1900. *The Institution.*

——— *Institute of Sanitary Engineers.* Proceedings, Vol. III., 1899. 136 pp., 8vo. London, 1899. *The Institute.*

Allan, *C. E., M.A., LL.B., and* **Allan,** *F. J., M.D., D.P.H.* The Housing of the Working Classes Act, 1890, and Amending Acts, annotated and explained, together with the Statutory forms and instructions. 214 pp., 8vo. London, 1900. *The Publishers (Butterworth & Co.).*

Allen, *A. Taylor.* Footpaths, their maintenance, construction, and cost. 37 pp. London. *The Author.*

Bage, *Charles. M.A., M.D.* Consumption. 16 pp., 8vo. Melbourne. *Australian Health Society.*

Bechmann, *G.* Renseignements Généraux sur les eaux et L'Assainissement de Paris. 32 pp., 8vo. Paris, 1900. *The Author.*

Bengal, Thirty-second Annual Report of the Sanitary Commissioner for. 131 pp., fcp. Calcutta, 1900. *Lieut.-Governor of Bengal.*

Bertillon, *Dr. Jacques,* Compte rendu des Cartogrammes et diagrammes relatifs a la Population Parisienne. 19 pp., 8vo. Paris, 1900.

——— de la Mortinatalité selon l'age du Fœtus et selon l'age de la Mère. 27 pp., 8vo. Paris, 1896. *The Author.*

Black, *Staff Surgeon W. T.* Sanitary State of Hong Kong in 1865. 8 pp., 8vo. London, 1869. *Surg.-Maj. W. G. Black.*

Board of Agriculture. Annual Reports of Proceedings under the Diseases of Animals Acts, the Markets and Fairs (weighing of Cattle) Acts, &c., &c., for the year 1899. 102 pp., 8vo. London, 1900.

——— Leaflets, Nos. 64 and 65. White Root Rot and The Small Ermine Moths. 6 pp., 8vo. London, 1900. *The Board.*

Clare and Ross. Ideal Homes for the People. 39 pp., quarto. Chelmsford, 1900. *The Authors.*

Corfield, *Prof. W. H., M.A., M.D.* Betegségek es egészségügyi tekintetben Hiányos Lakások. Elöadta a Londini Harvey-Társulat Körében forditotta Dr. Odön Frank. 24 pp., 8vo. Budapest, 1900. *The Author.*

Elder, *B. Scott.* Appeal Cases under the Food and Drugs Acts, 1875 and 1879, and Margarine Act, 1887. 78 pp., 8vo. London, 1900. *The Publishers (Butterworth & Co.).*

Filtre de Pierre, Emploi des, système Kurka breveté pour la Filtration en Grand. 17 pp., quarto. Paris, 1900. *Dr. A. Gifka.*

France, Stations Hydro-Minérales Climateriqués et Maritimes de la. 458 pp., 8vo. Paris, 1900. *E. White Wallis, F.S.S.*

Germany, Deutschlands, Heilquellen und Bäder. 267 pp., quarto. Berlin, 1900. *E. White Wallis, F.S.S.*

Gautier, *M. Armand, et M. N.* **Gréhant.** La viciation de l'atmosphère des Villes par les foyers industriels ou domestiques. 16 pp., 8vo. Paris, 1900 *Prof. M. N. Gréhant.*

Gréhant, *Prof. M. N.* L'Oxyde de Carbone le Grison et le Grisoumètre. 18 pp., quarto. Paris, 1898.

——— Notice sur les Titres et Travaux Scientifiques. 68 pp., quarto. Paris, 1887.

——— Nouvalles recherches Physiologiques sur les Mélange Explosifs de Grison et de Formène. 4 pp., 8vo. Paris, 1900

——— Recherches expérimentales sur l'alcoolisme aigu. 17 pp., 8vo. Paris, 1900.

——— Recherchessur l'alcoolisme aigu; dosage de l'alcool dans le sang et dans les tissus. 3 pp., quarto. Paris.

——— Recherches sur les limites de l'absorption de la oxyde de Carbone par le sang d'un mammifère vivans. 7 pp., 8vo. Paris, 1900. *The Author.*

Grancher, *M. le Prof. J.* Un service Antiseptique de Médecine: Statistique de dix années. 67 pp., quarto. Paris, 1900. *The Author.*

Home Office. Annual Report of the Chief Inspector of Factories and Workshops for the year 1899. 487 pp., fcp. London, 1900. *Arthur Whitelegge, M.D., Chief Inspector.*

Henry, *Louis, M.D.* The Influence of Milk in the production of dissemination of disease. 20 pp., 8vo. Melbourne. *The Australian Health Society.*

Hughes, *W. Kent, M.D.* The Human Foot, its use and abuse. 15 pp., 8vo. Melbourne. *The Australian Health Society.*

Kitasato, *Prof. Dr. S.* Bericht über die Pestepidemie in Kobe und Osaka von Nov., 1899 and January, 1900. 126 pp., 8vo. Tokio, 1900. *The Author.*

Latham, *Baldwin, M.Inst.C.E.* The Climatic Condition necessary for the Propagation and Spread of Plague. 35 pp., 8vo. London, 1900. *The Author.*

Lincoln Health Exhibition. Report, Catalogue, and Lectures. (August, 1899.) 8vo. Lincoln, 1899. *W. H. Curtin.*

London County Council. Opening Ceremony by H.R.H. The Prince of Wales of the Boundary Street Area, Bethnal Green. 16 pp., quarto. London, 1900. *Purchased.*

MEDICAL OFFICERS OF HEALTH AND OTHER SANITARY REPORTS.

Birkenhead, 1899 ..	.. *R. Sydney Marsden, D.Sc., M.B., D.P.H.*
Calcutta, 1899 ..	.. *J. N. Cook, D.P.H.*
Carnarvon Combined Districts, 1899 ..	.. *P. Fraser, M.D., B.Sc.*
Chester C.C., 1899 ..	.. *Francis Vacher, F.R.C.S.*
Durham C.C., 1899 ..	.. *T. Eustace Hill, M.B., B.Sc.*
Hackney, 1899 ..	.. *J. King Warry, M D., D.P.H.*
Huddersfield, June, 1900	.. *E. G. Annis, M.R.C.S., D.P.H.*

Hunter River, N.S.W., 1899.	*Robert Dick, M.B., C.M., D.P.H.*
Montreal, 1899	*Louis Laberge, M.D., M.O.H.*
Northampton C.C., 1899	*Charles E. Paget, M.O.H.*
Nottingham, 1899	*Philip Boobbyer, M.B.*
Oldham, 1899	*J. B. Wickinson, M.D., D.P.H.*
St. Helens, 1899	*F. Drew Harris, M.B., D.P.H.*
St. Mary, Battersea, 1899 (San. Insp.)	*I. Young.*
Salford, 1899	*C. H. Tattersall, M.R.C.S., D.P.H.*
Wandsworth District Board of Works, 1899	*The Board.*
Southport, 1899	*J. J. Weaver, M.R.C.S.*
Sunderland, 1899	*Harold Scurfield, M.D., D.P.H.*
Sydney, 1899	*The Board.*
Warwickshire C.C., 1899	*A. Bostock Hill, M.D., D.P.H.*
Wolverhampton, 1899	*H. Malet, B.A., M.D.*
York, City of, 1899	*Edmund M. Smith. M.D., C.M., D.P.H.*

Local Government Board. Memorandum by Dr. L. W. Darra Mair on a brief visit to the Pontypridd Urban District with reference to a fatal prevalence of Diphtheria therein. 7 pp., fcp. London, 1900.

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NOTES ON LEGISLATION AND LAW CASES.

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OFFENCES.—*Continuing offence—Work executed in contravention of by-law—Continuance in same state—Builder without power to remedy breach—Public Health Act, 1875 (38 & 39 Vict. c. 55), s. 158.*

By the Public Health Act, 1875, s. 158, where the execution of any work is an offence, in respect whereof the offender is liable in respect of any by-law to a penalty, the existence of the work during its continuance in such a form and state as to be in contravention of the by-law shall be deemed to be a continuing offence.

A builder was convicted for building a house without sufficient air space, contrary to a by-law. The builder was not the owner, and had not been in possession, nor had any right to go on the premises after the conviction. Afterwards the builder was prosecuted for a continuing offence in respect of the continuance of the work in the same state, in contravention of the by-law, and convicted. On a case stated:—

Held, that the builder, having no power to remedy the breach complained of, was not guilty of a continuing offence, and the conviction was wrong.—(WELSH & SON *v.* WEST HAM CORPORATION.) Div. Ct. [1900] 1 Q. B. 324.

COST OF SANITARY WORKS.—*Capital or income—Leasehold houses—Equitable Tenant for life—Repairs—Ground Rent—Public Health (London) Act, 1891 (54 & 55 Vict. c. 76)—Dangerous structures notice—London Building Act, 1894 (57 & 58 Vict. c. ccxiii.).*

There is no distinction in the position of an equitable tenant for life of leaseholds where the property is sub-let at a rack-rent, and where it is sub-let at an improved ground-rent; as between tenant for life and remainderman the cost of complying with a sanitary notice under the Public Health (London) Act, 1891, and a dangerous structures notice under the London Building Act, 1894, is chargeable against income. *Re* COPLAND'S SETTLEMENT. (JONES *v.* CARDEN.) Byrne, J. [1900] W. N. 14; [1900] 1 Ch. 326.

DRAINAGE EXPENSES.—*Capital or income—Leasehold houses—Outgoings—Improvements—Capital money—Conflict between Settlement and Act—Settled Land Acts, 1882 (45 & 46 Vict. c. 38, ss. 25, 51, 56); 1890 (53 & 54 Vict. c. 69), ss. 13, 15.*

The cost of reconstructing the drainage of leasehold houses, forming part of a residuary estate bequeathed to trustees upon trust for tenant for life and remaindermen :—

Held, to be payable out of capital money, as an improvement within the meaning of the Settled Land Acts, notwithstanding a direction in the will that pending a sale the rents, after payment of "all incidental expenses and outgoings," were to be paid to the tenant for life. *Re* THOMAS. (WEATHERALL *v.* THOMAS.) Byrne, J. [1900] Ch. 319.

SEWERS AND DRAINS.—*Vesting in local authority—"Sewers made by any person for his own profit"—Local Government—Public Health Act, 1875 (38 & 39 Vict. c. 55), s. 13, sub-s. 1.*

A drain was made by the owner of a quarry for the purpose of collecting and carrying off surface water coming on to his land and preventing it from running over the quarry. By means of the drain the quarry could be more economically and conveniently worked than if the water were allowed to spread over it :—

Held, that the drain was a sewer made by a person for his own profit within the meaning of s. 13, sub-s. 1, of the Public Health Act, 1875, and did not vest in the local authority of the district.

Decision of Div. Ct. [1899] 1 Q. B. 979, reversed.

LOCAL GOVERNMENT.—*Streets—Paving Expenses—Alteration of width of carriageway and footway—Power of urban authority—Public Health Act, 1875 (38 & 39 Vict. c. 55), s. 150.*

An urban authority, when paving and making good a street, not being a highway repairable by the inhabitants at large, under s. 150 of the Public Health Act, 1875, has no power to alter the respective widths of the carriageway and footway of the street.—(ROBERTSON *v.* BRISTOL CORPORATION.)

2 Q. B. [1900] 198.

London Street—"New street"—Paving Expenses—Liability of Frontagers—Lapse of time since road became new street—Metropolis Management Act, 1855 (18 & 19 Vict. c. 120), s. 105.

In 1883 a highway, the greater part of which was then paved, became a "new street" within the meaning of s. 105 of the Metropolis Management Act, 1855, which enables a metropolitan vestry or district board to pave any "new street" not paved to their satisfaction, and to charge the expense on the owners of the houses forming the street. From 1883 to 1899 the district board and the vestry who succeeded them, repaired the footways and carriageway of the street as surveyors of highways. In 1899 the vestry resolved to exercise their powers under s. 105, and required the owners to pay the apportioned expenses of paving the street :—

Held, distinguishing Bonella *v.* Twickenham Local Board, (1887) 20 Q. B. D. 63, that, as neither the board nor the vestry had exercised their powers under s. 105 before 1899, the vestry were then entitled to exercise them, notwithstanding the time which had elapsed since the road became a new street.

A road may become a "new street" within s. 105 of the Metropolis Management Act, 1855, although all the land on one side of it is building land upon which no building has been erected.—(SIMMONDS BROTHERS, LIMITED, *v.* FULHAM VESTRY.)

Div. Ct. 2, Q.B. [1900] 188.

SANITARY CONVENIENCE.—*Public Health—Stable—Workplace —Person in attendance—Cabmen—Public Health (London) Act, 1891 (54 & 55 Vict. c. 76, s. 38).*

Section 38 of the Public Health (London) Act, 1891, enacts that every factory, workshop, or workplace shall be provided with sufficient and suitable accommodation in the way of sanitary conveniences, regard being had to the number of persons employed in or in attendance at such building:—

Held, that a stable-yard and stables at which a large number of cabmen were daily in attendance for the purpose of hiring cabs was a workplace within the meaning of the section, and must, therefore, be provided with sufficient and suitable sanitary conveniences for the cabmen.—(BENNETT *v.* HARDING.)

Div. Ct. 2 Q. B. [1900] 397.

ADULTERATION.—*Sale to prejudice of purchaser—Defence that article bought with written warranty—Subsequent proceedings against wholesale merchant—Certificate of analyst—Evidence—Sale of Food and Drugs Act, 1875 (38 & 39 Vict. c. 63), ss. 6, 14, 21, 25—Margarine Act, 1887 (50 & 51 Vict. c. 29), ss. 6, 7, 12.*

Where, upon the hearing of a summons under s. 6 of the Sale of Food and Drugs Act, 1875, the defendant establishes the defence under s. 25 of the Act that he bought the article with a written warranty and sold it in the same state as when he purchased it, the certificate of the public analyst used in those proceedings is not evidence in subsequent proceedings before justices against the person from whom the defendant purchased the article.

Upon the hearing of a summons under the above section for selling as butter an article which was not of the nature, substance, and quality of the article demanded, the certificate of the public analyst showed the article sold to be margarine; the summons was, however, dismissed on the defendant proving a purchase with a written warranty from the respondents. A summons was then taken out against the respondents under s. 6 of the Margarine Act, 1887, for delivering the margarine in a package not marked as required by the section, and at hearing before justices the same certificate was tendered as evidence against the respondents, but was rejected:—

Held, that the certificate was not evidence against the respondents that the article sold and delivered by them was margarine, and that the evidence was properly rejected.—(TYLER *v.* KINGHAM & SON, LIMITED.)

Div. Ct. Q. B. [1900] 413.

ADULTERATION.—*Sample—Purchase for analysis—Mode of dividing sample—Sale of Food & Drugs Act, 1875 (38 & 39 Vict. c. 63), s. 14.*

Where a purchase is made of several articles of food or drugs at the same time for the purpose of analysis, each article purchased must be divided into three parts, and otherwise dealt with as required by s. 14 of the Sale of Food and Drugs Act, 1875. Where a purchase is made of six bottles of the same article of food or drug, each bottle is for the purposes of the Act a separate article, and it is therefore not a sufficient compliance with the requirements of s. 14 for the purchaser to divide them into three lots of two bottles each without opening any of the bottles, and to hand one lot to the analyst, one to the seller, and to retain one himself.—(MASON *v.* COWDARY.)

Div. Ct. 2 Q. B. [1900] 419.

GENERAL NOTES.

TENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

The meetings were held in Paris from 10th to 17th August, in the Ecole de Medicine, under the Presidentship of Prof. Brouardel—The Sanitary Institute was represented at the meeting by Prof. W. H. Corfield (Vice-President), who was elected an Hon. President of the Congress—Mr. Wynter Blyth (Chairman of Council), Dr. P. Boobbyer, Dr. A. Newsholme, Prof. Lane Notter, Dr. S. Rideal, Mr. H. A. Roechling, and Mr. E. White Wallis, Secretary. Several Members and Associates of the Institute were also present.

The opening meeting was presided over by M. Waldeck-Rousseau (Prime Minister of France), who welcomed the Congress in the name of the French Government. In the following extracts from his speech he acknowledged how much the government of a country were indebted to men of science.

"Preventive medicine was most complex and this might be explained by the fact that it could be considered as the crown of all natural sciences. The discoveries of physicians, of chemists, and of engineers, were the materials out of which hygiene was constructed. But to realise the ingenious theories of the hygienists, the help of the state was needed. They had every right to rely on such help. You are the most valuable and indispensable collaborators of all government. You are the guardians of public health, that is to say, of the most precious gift a State can possess. For too long Governmental and Parliamentary initiative has neglected the elaboration of indispensable sanitary laws. For too long the incontestable right of the State to impose upon the individual necessary preventive measures, which, while protecting his health, preserve the public welfare, has been overlooked and misundestood. The rights of the individual badly interpreted have prolonged this delay. It is a matter of education and the democracies will insist that such education shall be given."

Prof. Corfield spoke on behalf of the representatives from Great Britain; he recalled the fact that many years ago he had been a student in that same amphitheatre in which they were meeting. He was glad that the English Government appeared to be taking more interest in these Congresses, and recognising the good that they were doing—this year they had appointed five official representatives, at the last Congress they only appointed one, and at many of the Congresses no representatives had been appointed by the Government.

In the Section of Engineering and Architecture there was a long discussion on the desirability of disconnecting traps on house drains. The report presented by M. Lacau (Vice-President of the French Society of Sanitary Engineers and Architects) and M. Louis Masson (Inspector of Sewers and Sanitary Works, Paris) shows a complete divergence between the majority of British sanitarians and the authors of the report—they declare themselves altogether opposed to the use of the disconnecting trap: they admit that if the air of the sewer be considered as the immediate vehicle of infectious germs, the interception system might be considered the best, but it has been recognised that this theory of the diffusion of infectious diseases, such as cholera, typhoid, and diphtheria, by sewer gas is incompatible with our present knowledge of the principles of the propagation of diseases. The employment of the trap leads to the stagnation of the water and the fæcal matters, and it has been calculated that a trap of 6 in. diameter contains 10 litres of water, the velocity of which does not exceed 4 in. per second, and that therefore there can be no vigorous flush. In consequence the solids brought down by the water remain in the trap where they are liable to putrefy, and occasion putrid emanations in the conduits. This is why, as the result of experiments made by the Sanitary Institute, from 20 per cent. to 60 per cent. of the fæcal matter from a water closet remained in the trap, and that only the balance escaped to the sewer. Hence with the trap system the rapid evacuation of all the waste water and the waste organic matter is not effected while fresh, and before fermentation has set in. Instead of from 1 per cent. to 14 per cent. of solid matters remaining in conduits of 6 in. diameter, the proportion remaining in the disconnecting trap varies from 20 per cent. to 60 per cent., the average being from 25 per cent. to 35 per cent., and the quantity of water necessary to flush them, instead of being 9 litres rises to 14 litres and even 15 litres for each evacuation. Thus necessarily an augmentation in the quantity of water to be supplied to towns is implied.

Mr. H. A. Roechling said it had been stated in the report that the sewers in England were foul and poorly constructed, a good deal of gas forming in them in consequence of their defects. He maintained that this was not so, and took a strong objection to the statement. There were a few cases, especially in the older portions of London, where the sewers were not so good as they might wish to see them, but where they were newer they were more scientifically carried out. As a rule the sewers of England were as good as they could be made, and were managed as efficiently as in other countries, if not better. It has been stated in the paper that in experiments made by the Sanitary Institute, as much as 50 per cent. of foul matters had remained in the disconnecting trap, but it had not been stated that these experiments were connected with a water-closet which was equivalent to a water-closet placed in a cellar. If we in England had houses of five or six storeys high as they had in Paris, inhabited by from sixty to 100 people, each person being supplied with sixty gallons of water per day, the flush obtained would have been more than sufficient to clear away all deposits from the trap. It was clear that if in the actual circumstances under which these experiments were made only 50 per cent. of deposit remained in the trap, nothing at all would have remained in it in ordinary circumstances: the experiments referred to might with greater justice be cited as an argument in favour of the adoption of the disconnecting trap as in England.

The hygiene of infancy and childhood was brought forward in Section IV. and school hygiene, in which the Sanitary Institute is so much interested, was discussed in a report by Dr. Variot. on "The Medical Inspection of Schools from the Hygienic Point of View." In his report he dealt with the requirements of school buildings, general health of scholars, means of preventing the spread of infectious disease—and first aid to the injured, but he omitted altogether the important questions of the hygiene of the mental and moral conditions of school life, a subject which forms a large part of the syllabus prepared by the Sanitary Institute for the examination of school teachers, and which has such an important bearing in the training and mental development of children.

Papers were read in other sections on "Insanitary Dwellings," by Dr. Challamel, Advocate of the Court of Appeal, Paris, and another on "Hotel Bedrooms from the Sanitary Point of View," by M. Gustave Rives, architect to the Touring Club of France, which set out the requirements of air space and ventilation on a scale that would fill a modest English householder with envy, and yet a casual visitor to the meeting could not help noticing, and being distinctly sensible of the fact, that in every one of the rooms in which the Congress meetings were being held there was an utter absence of ventilation, and in the ordinary hotel bedrooms the arrangement of the windows and fittings was such that appropriate ventilation was almost impossible.

The work of the sections is summarised in the following resolutions which were unanimously approved at the closing meeting of the Congress:—

The Congress was of opinion that it was absolutely necessary for the authorities in all countries to establish bacteriological laboratories, where bacteriological examinations could be made gratuitously.

That no children who had suffered with diphtheria should be allowed to return to school till it was shown by bacteriological examination that there was no longer any risk of their spreading the disease.

That there should be an international commission to study the question of serums, and to endeavour to establish uniformity in the activity of serums. This latter resolution was taken only as a recommendation so as not to tie the hands of the next Congress.

That the progress accomplished in the methods of vaccination was so great that no objection was justifiable, and therefore that vaccination should be rendered obligatory in all countries.

That all tins containing preserved meat, fish, &c., should bear the date of their manufacture; and that rules for the preservation of food in tins should be published and distributed among all persons engaged in the trade.

That no chemical should be employed for the preservation of food.

That better laws, or laws better applied, are needed for the preservation of rivers from industrial and other pollution, and also for the preservation of the intakes of potable water.

That a commission should be appointed for the purpose of endeavouring to assimilate the methods employed in the bacteriological examination of water used for drinking purposes.

That latter resolution again was taken as a recommendation to the organisers of the next Congress.

That the inspection of meat should be enforced, and the methods of control assimilated in all countries. It was recommended that an international congress of veterinary surgeons, and others, should meet for this purpose, and also so as to establish a basis for uniform teaching in all countries as to the methods of controlling the meat supply.

That there should be public slaughter houses in all large centres. That small centres should federate so as to have one public slaughter house between them.

That where it was absolutely impossible to have a public slaughter house, the killing in private slaughter houses should only take place at fixed hours, and should be under the control of the local authorities.

That inferior but wholesome meat might only be sold in especially indicated localities; and inspectors should have the right to visit all such places both day and night.

That lead be replaced by antimony in the proportion of from two to five per cent., and the soldering of tins containing preserves with lead could only be sanctioned when done in such a manner as to prevent the lead entering the tin.

That domestic hygiene necessitated the immediate removal of all soil, slop-water, &c., and the trapping of all pipes. That such pipes should be fully ventilated throughout, but that it should be impossible for sewer air to enter the houses.

That plumbers work should be carefully supervised and so placed as to be free from the danger of frost.

That the overcrowding of dwellings should be illegal, and the law should sanction police measures against this offence.

That municipalities should, by reducing taxation and other means, encourage the building of model artisan dwellings.

That gratuitous bathing establishments should be constructed.

That streets and backyards should be widened on all possible occasions.

That professional diplomas should be delivered to plumbers who had passed test examination.

That smoke, especially black smoke, should be prevented by enforcing the use of smoke-consuming processes.

That hygiene should be taught in all primary and secondary schools, and special care be taken to educate young girls in matters affecting domestic hygiene.

That the Congress approved and encouraged the practice of cremation.

That statistics on the effect of various industries on the health of workers should be collected in all countries.

That the laws restricting the employment of toxic substances for industrial purposes should be strengthened, and better measures taken to prevent dust in mills and factories, and this even when such dust did not contain poisonous particles. Where, however, efficient ventilation was not possible, the workpeople should be made to wear masks, spectacles, &c. In all cases notices should be put up clearly indicating the danger and the precaution that should be taken.

That the Congress approved of all laws that enforced the providing of seats for the use of shop assistants.

That there should be schools for the teaching of Colonial hygiene.

That sanatoriums should be established in the Colonies.

That there should be available means for the gratuitous treatment of syphilis.

That ships trading with countries where plagues prevailed should be provided with the anti-plague serum.

That ships' surgeons should be independent of ship owners.

That the number of ships' surgeons should be increased, and more care taken to ensure good sanitation on board ship.

That no person suffering from an infectious disease should be allowed to travel in a train. Such persons should warn the station-master and special trains should be provided.

That railway carriages should be more suitably furnished and more easy to disinfect.

That all possible means should be taken to prevent spitting in carriages or at railway stations. Any railway servant suffering from tuberculosis must not be allowed to expectorate in the offices or stations.

That severe measures should be taken against railway servants who are convicted of drunkenness.

That better and brighter lights are required for the railway services.

That water and steam are the best mediums for heating railway carriages.

That conductors of omnibuses, tramways, &c., have not the power to prevent expectoration within these vehicles, but that some means should be found to stop such practices.

That an international committee should strive to agree upon a uniform method of disinfecting cattle vans.

That passenger ships should be better ventilated.

A grand reception was given at the Elysée, by the President of the Republic and Madame Loubet, to delegates to this and other Congresses that were being held, the Shah of Persia and his suite being among the guests.

M. Waldeck-Rousseau at his official residence gave a dinner to eighty of the delegates from foreign governments, followed by a general reception to which all the members of the Congress were invited.

An afternoon reception was also given at the Hotel de Ville,—and visits were arranged to the sewage farms and other places.

An invitation to hold the next meeting in Brussels in three years time was unanimously accepted.

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JOURNAL
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THE SANITARY INSTITUTE.

SOME PRACTICAL ASPECTS OF THE PLAGUE AT SYDNEY.

By FRANK TIDSWELL, M.B., Ch.M., D.P.H.
Principal Assistant Medical Officer of the Government of New South Wales.
(Member).

Read at the Sessional Meeting, December 12th, 1900.

In responding to the honour of the Committee's invitation to address you on the subject of the plague at Sydney, I am not prepared to present a connected account of that epidemic. The official report, which will soon be available to you, is much more complete and satisfactory than anything I could reproduce from memory. I have to ask your acceptance of a paper unavoidably sketchy, as owing to the lack of means of reference to precise data and documents, I am obliged to offer you broad outlines rather than detailed pictures. But this is perhaps not much to be regretted since classical descriptions of plague have now become so numerous, that it is little short of an infliction to have to read, let alone write, another. With this claim upon your indulgence, I venture to invite your attention to some items of our experience in Sydney as regards, (1) the recognition of plague, (2) its mode of dissemination, and (3) the preventive measures applied.

(I.) The Recognition of Plague.

The incidence of plague on Sydney was to some extent anticipated. That is to say, its wide dispersal during the last few years, and especially its southerly trend, led us to prepare ourselves, as far as possible, to meet and cope with it should it appear amongst us. But so far as the recognition of the disease was concerned, we had to depend on the mental picture we could form by perusal and analysis of available descriptions: for none of us had had any practical acquaintance with plague, nor was there in our medical community any gentleman so equipped to whom we could look for aid. It thus came about that, for my own part, I awaited the expected crisis with all the doubts incidental to untested conceptions. As a matter of fact the first case was a perfectly clear and straightforward one, and thus fortunately was recognised without difficulty. But our subsequent experience was to the effect that whilst the majority of our cases were equally easy of diagnosis, we would now and then meet with one concerning which we could express no decided opinion on the clinical evidence presented. Speaking generally, one may say that given a case exhibiting symptoms common to several acute febrile diseases, the only clinical manifestation that obviously invests it with the specific character of plague is the existence of a bubo. In the absence of this indication one can rarely be more than suspicious that the case is plague; the final adjudication, if forthcoming at all, is expressed by the bacteriologist, or only delivered at the *post-mortem* table. Hence it appeared to me that the points of most practical importance in the recognition of plague were associated with (*a*) the characters of buboes, (*b*) the indications other than buboes which should induce a suspicion of plague, and (*c*) the means of obtaining a bacteriological examination. I have therefore selected these three matters for consideration in this part of my paper.

Buboes.—I am unable to state from memory the exact proportion of bubonic cases in our epidemic, but that type of the disease was exhibited by the great majority of our patients. We had one or perhaps two pneumonic, and the rest were septicæmic. But I may here observe that although the same type was usually preserved throughout the illness, this was not always the case. Bubonic patients commonly became septicæmic and showed bacilli in the blood, and sometimes there was a secondary pneumonia, with bacilli in the sputum. Such mutations cannot be predicted, nor can they always be detected. I call attention to them in this place merely as an indication that it is not wise to attach a too rigid interpretation to the terms used in classifying the cases in an epidemic.

Our experience was not altogether in accordance with the statement that buboes usually appear on the third day of illness. We generally found them present on the second, and in many cases on the first day, whilst in a few instances they were amongst the very earliest symptoms noticed by the patient.

I recall upon this point the instance of a man, who first felt sick about noon, and developed a painful swelling in his groin about 4 p.m. on the same day. When I saw him next day at 2 o'clock—twenty-six hours after his falling sick—the bubo was already as large as a pigeon's egg, and formed a visible prominence in the left femoral region. In another case the first indication of illness was a sharp pain due to a bubo in the groin suddenly experienced whilst the patient was walking along the street. From our own cases I should have inferred that the bubo usually made its appearance before the third day of illness.

We had a preponderance of femoral buboes, although again I cannot state the exact proportion, nor the relative numbers on the two sides. It was most usual to find the lowest gland of the femoral group enlarged either alone, or to a greater extent than the others, but, as might be anticipated from anatomical considerations, this was not invariably the case. I am not quite sure whether inguinal or axillary buboes were next in order of frequency, but I think there was not much difference between the numbers. It was not common to find an inguinal bubo alone; there was generally some associated swelling of the adjacent femoral glands. In the axillary region, the bubo was frequently situated in a true gland of the armpit. One had to feel well up in order to palpate it. But there was a fair number of cases in which the bubo occurred in a gland under the outer edge of the pectoral muscle, and was not therefore a true axillary bubo. It happened on one occasion early in our epidemic that a bubo in this situation was overlooked at the first examination. It was then very small and did not happen to be pressed upon during palpation of the axilla. It revealed itself later, but the incident taught us to carefully palpate with slight pressure all glandular regions, whether indicated or not by the patient as a site of discomfort or pain. I may add that in a sick cat forwarded to the laboratory for examination and found to be suffering from plague, such a sub-pectoral gland was the site of the bubo. Cervical buboes were not very common, and when they occurred generally affected the glands in front of the sternomastoid muscle. We did not meet with any instance of popliteal bubo, and although in one case there was a swelling of the epitrochlear glands, specimens taken from it for bacteriological examination were repeatedly examined with negative results.

In speaking of buboes in the foregoing remarks, I would be understood as referring to the primary glandular swelling. As a rule indeed there was only one, or merely local extension from one group of glands to another in its neighbourhood. I have already mentioned the association of inguinal and femoral swellings, but in addition to this it was very common in purely femoral cases to elicit tenderness on pressure above Poupart's ligament. The indication thus afforded of extension to the iliac glands received confirmation by *post mortem* and experimental observations. But apart from such cases, enlarged glands were occasionally present in two totally different regions, as groin and axilla, or axilla and neck. They were sometimes on the same, and sometimes on different sides of the body. In a few instances there were bilatual enlargements, always either femoral or inguinal or a mixture of both, but the symmetry was never quite perfect—one side being more advanced than the other. I cannot say that the subsequent development of the second swelling, or of either of them, was in any way affected by the existence of the other.

As a general rule the buboes appeared quite suddenly, and enlarged rapidly. In the course of twenty-four hours the glands sometimes attained the size of a pigeon's egg, or even that of a walnut. But on the other hand, occasionally they never became bigger than a marble. It was usual to find several glands of a group enlarged, but one much more than the others. The detection of the gland itself, however, depended on very early access to the case. If this were obtained it was usually easy enough, by the rounded or oval shape, well-defined limits, &c., to satisfy oneself of the existence of a swollen gland. But it was not many hours before this became impossible, owing to the occurrence of hæmorrhagic exudation and œdema round the gland. When this had happened all that could be felt, as a rule, was a diffuse thickening in the region, having no definite shape nor margin. The amount of exudation, like the degree of swelling of the gland itself, was very variable. Sometimes it formed a mass filling up and causing a projection in the groin or axilla, and at others it was so scanty as to be scarcely evident. When the gland itself could be felt it was tense rather than hard, its consistence being, to my mind, comparable to that of the testicle. The periadenitic effusion was more or less firm, at all events at first, but later on it sometimes became soft enough to take an imprint of the fingers.

The skin over the bubo remained normal in colour for a time, and then became reddened, whilst with the approach of suppination it assumed a more violet tint. Sometimes in the later stages it showed discoloration as in a bruise, and in one or two instances there was actual hæmorrhage of a petechial character.

In nearly all cases the bubo was very tender; in some cases exceptionally so—the patient flinching and guarding it with his hand, or begging that it might not be touched. But usually gentle manipulation could be borne, and sometimes the swelling could be pretty freely handled without causing any great amount of pain. Apart from handling, the sensation in a bubo was described as a dull ache rather than actual pain, but this was often severe enough to induce frequent requests for renewal of hot applications, which seemed to be of great comfort to the patients. Any movement involving pressure on the bubo caused acute pain, and quiescent patients sometimes assumed positions which would minimise such pressure. Those with groin buboes would flex their thighs at the hip; those with axillary buboes hold their arm away from the side, and those with cervical buboes keep their head rigidly bent towards the side on which the bubo was situated. In a few instances the bubo appeared to be painless whilst the patient remained quiet. It may be that an impression of painlessness was often due to the patient not being able to appreciate his own sensations owing to mental depresssion or aberration.

The ultimate fate of buboes included resolution, suppuration, and sloughing and ulceration,—the exact issue depending upon the stage at which the inflammatory process stopped. Resolution was sometimes remarkably rapid, all sign of the swelling disappearing in a fortnight or three weeks from its first appearance. It was more common, however, for the signs of active inflammation to subside within this period, and the swelling to remain as a practically insensitive lump, gradually diminishing in size during the course of one or two months. The buboes that suppurated were opened in the usual way, and usually contained sanquinolent or creamy pus; occasionally shreds of necrotic tissue. After opening, the discharge became thinner and serous in character. Very often the sinus healed up in the ordinary manner, but sometimes its edges broke down and left a ragged ulcer, which ultimately went through the slow process of granulation.

It resulted from these various modes of fermination, that whereas some patients were quite well and able to leave the hospital within three weeks of their admission to it, there were others who had to be detained for nearly as many months. This was a practical point in the management of the isolation hospital, as the accommodation became strained now and again, owing to the accumulation of such convalescents. We had some doubt as to the proper way of dealing with that class in which the buboes, though inactive, nevertheless persisted as lumps. Our hand was forced to some extent by the pressure on our accommodation, and after observing the first few cases, we reluctantly had to let the rest go as soon as we were satisfied that inflammation in the buboes had really ceased. Of course, they were also completely free from constitutional symptoms. There is no theoretical reason really opposed to this procedure, and nothing against it appeared in our practice. It seemed to be a perfectly safe thing to do. But the question of patients with open sores was another matter. They were perfectly well except for the local lesion, which was sometimes very small. But although our own observations were in accord with the statement that plague bacilli cannot be detected in the discharges after a certain time, we did not feel justified in releasing such patients whilst any sign of discharge remained. Consequently, they accumulated in the hospital, blocked up beds, filled the convalescent wards, and so impeded the proper reception of acute cases. They thus constituted a real practical difficulty for which we discovered no solution.

Indications of plague other than buboes.—Failing the detection of a bubo, the opinion one can form amounts to a more or less well-grounded suspicion, based as far as I was concerned on general indications rather than precise symptoms. I do not wish to imply any neglect to ascertain, and estimate the significance of, the state of the temperature, pulse, tongue, etc., but that in plague, as in most other diseases, the search for characteristic physical signs was practically consequent on the impression afforded by the general aspect of the case. I have therefore elected to endeavour to portray the general conditions in which we found our various patients, adopting this course the more readily since the detailed symptoms exhibited by them were in accord with the many excellent descriptions now available, and with which you are no doubt familiar.

I call attention in the first place to cases in which the incidence was so swift, and the virulence so great, that the only suspicious element was the sudden death of the patient, and the only means of verification the *post-mortem* examination of the body. Thus there was one case in which a man, who had got up, taken his breakfast and gone out in accordance with his usual custom, was drinking at a bar when he complained of feeling very giddy and sick. He remained depressed and miserable for some time, and then went to the back premises of the hotel. A little while afterwards he was found dead in an outhouse. It was only at the autopsy that he was ascertained to have been stricken down by plague. There was another case in which a young girl fell sick one afternoon with headache, vomiting, etc., her attack being such as commonly follows, and was actually ascribed to, some dietary indiscretion. She died next day before noon, and on examination her organs generally were found to be teeming with plague bacilli. I may also mention that in another case in which the illness was recognised, the interval between the first symptom and death was only eighteen hours. These illustrations serve to show that our epidemic was not wanting in fulminant manifestations, the plague toxin occasionally exhibiting a potency little, if at all, less than that possessed by some of the vegetable alkaloids and mineral poisons.

Next in intensity to those already quoted came cases in which the incidence was equally rapid, but the virulence of less extreme degree. Amongst these were many instances of men becoming prostrated whilst at their work, to which they had gone in the morning without the least suspicion of being otherwise than in their ordinary state of health. For example, a printer had gone to business and worked at his machine for several hours. About mid-day he was seized with violent headache, nausea, and abdominal pain of a colicy character, and in a few minutes was stretched, pallid, tremulous, and prostrate, on the floor of the workshop. About three hours afterwards, when we saw him, he was lying upon some sacking with blanched face and closed eyes, helpless, motionless, speechless, in a condition of torpor from which he could not be roused. He was sent directly from the workshop to the quarantine hospital, and next day developed a bubo in his groin. This degree of prostration, though not often reached so quickly, was comparatively common in cases after admission to the hospital. Absolute unconsciousness was unusual, save as the immediate precursor of death, but a condition of profound apathy was very frequently seen. The patient would generally lie curled up in bed, on one or other side, but sometimes assumed the position of dorsal decubitus. There was no rigidity about either position, the patients could be easily moved into any other, and sometimes changed on their own accord. But having taken up such a position they would remain in it for hours, lying quietly with their eyes closed, perfectly indifferent to their surroundings, content so long as they were left alone. If disturbed they would wearily open their eyes for a moment and bestow upon one a vacant glance, perhaps frightened, perhaps reproachful, and promptly relapse into their torpid condition. They would swallow liquid food and medicine poured into their mouths, submitting to this and other necessary attentions without apparently the least appreciation of what was being done to them. Even the handling of the bubo usually failed to produce more than a wincing of the face expressive of pain, unaccompanied by any movement of resistance. This condition sometimes ran on to coma and death, and sometimes passed away in a few days, leaving the patient very weak but convalescent.

The next type of illness to which I direct attention was that exhibited by the majority of our patients. The onset, though still rapid, was not so appallingly sudden as in those already mentioned. There was an interval of some hours between the premonitary symptoms and prostration, during which the patients were usually able to get home to bed. The very first case of the epidemic occurred in a carter who had gone to work in the morning feeling perfectly well, as was usual with him. About twelve o'clock, whilst driving his team, he suddenly developed violent headache, giddiness, and nausea, which compelled him to tie up his horses and lie down. He could not eat his lunch and continued to feel sick, but he managed to resume his journey and completed it about four o'clock. At that time he felt a pain in his groin and on examination found a lump there. He reported himself sick, put up his horses and went home to bed. He is said to have vomited and been very sleepy and feverish during the evening. He was visited next day at noon by his private medical attendant, and in response to a report by that gentleman I saw the patient at two o'clock. He was then curled up in bed as if sound asleep, but he roused at once when I spoke to him. His face was pale, with a febrile flush on the cheeks, and his expression that of a man not quite conscious of his whereabouts. He answered my questions in a weary kind of way, but quite intelligently, and although speaking slowly the enunciation of words was perfectly clear. He professed feeling very weak, comparing his condition in this respect to those experienced in a previous attack of influenza. He could easily move about the bed and sat up without assistance when requested to do so, but he evidently preferred the recumbent posture, resuming it as soon as possible. For the rest I need only mention that he had a temperature of 105·4°, a rapid but fairly strong pulse, and a left femoral bubo as large as a pigeon's egg.

The picture here presented, though a common one, was often modified by a much greater degree of torpidity. The patients could be less easily roused from their sleep-like condition, and on being left alone promptly relapsed into it. When so lying in bed the expression on their faces sometimes suggested dreaming, and whilst at others placid, it was never entirely vacant. When roused up the expression was often one of anxiety, fright, or bewilderment, as when a person is awakened from deep sleep. They would answer questions, or attempt to do so, often exhibiting the clipped or mumbling speech mentioned by authors. Their drowsiness often resulted in their not following what was said to them, and in their failure to utter more than half sentences, forgetting the rest. They were generally biddable, being too sick to resent or resist interference, and moreover they could generally be made to appreciate the efforts made for their comfort. The positions assumed were also indicative of the retention of sensibility, for in these patients one observed the attitudes designed to relieve pressure on a bubo, viz., flexion of the thigh, elevation of the arm, &c. The condition was of variable duration, and of no significance as to the ultimate issue of the case.

In other instances, although the onset itself was not excessively rapid, there was a period at which the symptoms would suddenly become distressingly acute. For example, a young man having spent the evening socially at a friend's house, went home and retired to bed, apparently in his usual state of health. During the night he vomited, and next morning complained of nausea and headache. He did not go to business, and appeared to get better during the day. Towards evening he became listless, drowsy, and light-headed, and when seen at midnight he was flushed with fever, quite prostrate, and delirious. He was transferred to the Quarantine Hospital early next morning, and in that institution had a series of hæmorrhages from the mouth, nose, and bowels, developed a purpuric rash, and died on the fifth day of illness during copious bleeding from the lungs. It was not often that patients were found delirious at an early stage, this condition more commonly supervening after admission to the hospital. The delirium was generally noisy, taking in some cases the form of incessant chattering, and in others that of more or less frequent spasmodic outcries. In nearly all cases the utterances were incoherent, babbling, and meaningless, with perhaps a single word distinguishable here and there. Associated with the mental, there was also muscular unrest, tremors, spasmodic contractions, or purposeless movements of the limbs or head. Rarely a patient would excitedly sit up in his bed, or try to get out of it, and sometimes struggle when his efforts were resisted.

In connection with the class of case now under consideration I may perhaps be permitted to cite one illustrative of the mode of attack in a young child. A little boy, aged two years, had been bright during the day, but was noticed to be unusually quiet in the evening. During the night he had a series of convulsions. Next morning the child was admitted to one of the general hospitals. There he lay all day in his cot, very pale, drowsy to torpidity, having no regard for food, nor the surroundings, and making no sound unless disturbed, when he uttered plaintive cries. This condition, for which there was no discoverable cause, roused the suspicions of the superintendent, and in our joint examination of the case next day we discovered a bubo in the axilla, fluid obtained from which contained an abundance of plague bacilli. The child died early next morning.

The series of cases just quoted represent conditions sufficiently serious to arrest attention, and lead to further investigation. Hence they usually came under our notice at an early stage, and presented no special difficulties in the matter of diagnosis. But interspersed amongst them were many which failed to suggest the idea of plague, by reason of the mildness of the symptoms at the time they were examined. In these cases the onset was sometimes comparatively slow, and the amount of enfeeblement moderate. Suspicion attached to them mainly on account of their unexplainable illness having occurred during the prevalence of a plague epidemic. Such patients would sometimes be found in bed, complaining of the general aches and weariness that so commonly precede the onset of a fever, and often indicated the lumbar region of the back as the site of their greatest intensity. The recumbent attitude, however, was more a matter of inclination and comfort than necessity. The invalidism was of a mild character, and the patients could, and did, attend to their own wants, getting out of bed actively enough when they had occasion to do so. Frequently they were not found in bed, but up and dressed, sitting moodily in a chair, or moping about the house in a restless, aimless kind of way. Their mental condition was usually quite clear. They frequently had no definite symptoms, showing little beyond slight elevation of the temperature, with corresponding increase in the frequency of the pulse, and perhaps a coated tongue, anorexia, constipation, etc., such as might attend the onset of many febrile illnesses. Consequently it sometimes happened that judgment on such cases had to be suspended for a time, but it was usually not long before their true nature was revealed by the appearance of a bubo, or the accession of severely prostrating developments. As an illustration of the class of case here referred to I recall the instance of a clerk who went to business one morning, being, as far as he knew, in his usual health. He had an attack of colic and vomiting during the day, and went home early. He attended his office next morning, and although seedy, remained there all day. Next morning he went to work again, but as he looked ill and complained of weariness, headache, and aching of the body and limbs, he was allowed to go home. It was next day—the fourth of his illness, that I was asked to see him by his private medical attendant. I found him up and dressed, wandering about his house, and looking, as he expressed it, "a bit knocked out." He had some pallor, a pinched expression, walked slowly, and let himself down into his chair in a way suggesting feebleness of old age. The wife said he had been "talking a lot of nonsense," but he spoke to me intelligently, and knowing my name exhibited considerable curiosity as to my opinion of him. He was also alert enough to refrain from mentioning a swelling under his arm, where I subsequently found a bubo as big as a walnut, and surrounded by diffuse œdema. He went to the Quarantine Hospital in the afternoon, and died three days afterwards.

As in this patient, so in others of the same class, there was no real clouding of the intellect. They were sometimes irritable, or peevish, and resented interference, but quite alive to the objects of our visits, and perfectly prepared to mislead us if they could, as to the real nature of their illness. For as the epidemic progressed we became known as the plague inspectors, and our clinical attentions carried with them the prospect of incarceration at the Quarantine Station. This was not always conducive to cordiality of reception, nor to that perfect confidence which should exist between doctor and patient. It was particularly in the matter of buboes that fertility of explanation was most manifested. They were ascribed to what was commonly called, "barking" of the skin, to scratches with dirty metal, to cuts, or abrasions, to anything, in fact, that would tend to divert suspicion from their real cause.

On the other hand there were many patients, representing the mildest type of the disease, who, because they had a bubo or some other symptoms described in that morning's paper, voluntarily went to the hospitals, or came to the offices of the Department of Public Health, in order to confirm or dissipate their own impression that they were attacked by plague. These people were often worried by the anxiety of doubt, and our diagnosis, whichever way it went, was usually a great relief to them. It is not to be supposed that those who really had plague represented true ambulant cases; they usually became very ill later on and some of them died. They are mentioned as showing that there is not inevitably any marked reduction of strength at a time when the case nevertheless can be clearly recognised as plague. It may indeed be asserted that in a few cases there was never anything approaching serious debility throughout the whole period of illness.

I may mention finally upon this point that the condition presented at any particular time could rarely be relied upon as a guide to the future progress of the illness. At nearly all stages up to established convalescence there was a liability to sudden and unexpected changes of serious or even fatal consequence. As will be explained presently the patients were always conveyed in charge of trained attendants from their homes to the Quarantine Hospital, first by ambulance and then by steam launches. There was one man transferred from his house to the ambulance, and from the ambulance to launch upon a stretcher, who felt so little ill that he refused to obey the nurse's order to remain lying down. He sat up during the half hour's journey down the harbour and appeared to be enjoying the trip. As the launch approached the landing jetty, this man stood up, waved his arm, fell back, and died almost immediately afterwards. No doubt his death was due to failure of the heart consequent on the degeneration of its fibres that occurs in plague. It was particularly in patients apparently mildly ill or progressing favourably that this untoward complication was apt to occur with startling abruptness, and we learned to regard the issue of any case as uncertain until all constitutional symptoms had quite passed away.

In the foregoing paragraphs I have dealt with the question of the clinical recognition of plague from the health officer's point of view, devoting attention to the subsequent course of the illness only in so far as was desirable in order to complete the illustrations. The endeavour has been to represent, so to speak, the various grades of illness in which our various patients were discovered when first coming under our notice. In doing this I have ventured to offer illustrations not only of cases of typical or average severity, but also of others expressive of variations up to the extremes in both directions. The general outcome is to suggest that plague can be recognised if there be a characteristic bubo, and reasonably suspected on evidence of a person having been suddenly and violently stricken down with illness of a severely toxic nature. Where neither of these conditions obtain, a decision must perforce be withheld pending further investigation and developments. I would submit, however, that the effort to present a comprehensive view has involved the elimination of minor details to which one or other clinician has attached considerable diagnostic significance. But the value of these is to be appreciated only or mainly by those who have had practical acquaintance with plague. Their accurate interpretation depends on what it has become fashionable to call personal equation; they constitute the bright spots of that kind of experience that has been compared to the stern lights of a ship, illuminating only the track that has been traversed. However valuable to their possessor they can rarely be conveyed to others, and therefore I have abandoned the idea of attempting to delineate such delicate indices.

The means of obtaining a bacteriological diagnosis.—The third practical point in the recognition of plague selected for consideration concerns the means used to obtain a bacteriological examination. The arrangements made at Sydney were, that on report from a private practitioner of a case of plague, or one that might be such, it was immediately visited by a member of the official staff of the Department of Public Health. The visiting medical officers carried with them in their bags, amongst other things, a sterilised hypodermic syringe fitted with platino-iridium needles, a platinum wire loop in a glass handle, two culture-tubes, one agar and one serum, a metal box of sterilised cotton wool, a small bottle of lysol, a small wide-mouthed stout glass bottle, a spirit lamp, and about a dozen cover-glasses. These articles were all prepared beforehand in the laboratory of the Department, and as used were replaced by a fresh set. With this apparatus they were always able to obtain, in doubtful cases, samples of bubo fluid, blood, or sputum, in a way that gave a reasonable prospect of success in the subsequent examination.

We never attempted to incise a bubo, save in the hospital, on account of suppuration; the fluid for diagnostic examination being always obtained by puncture and aspiration with the needles and syringe, after preliminary cleansing of the skin. Any fluid obtained was conveyed to the laboratory in the barrel of the syringe, and there taken from it to inoculate culture tubes and a guinea-pig, and to make cover-glass preparations. Sputum was taken in the sterilised wide-mouthed bottle, and at the laboratory treated in the same way as bubo fluid. With blood, the culture tubes were inoculated, and cover-glass smears prepared at the bedside of the patient.

Puncture of a bubo did not always yield fluid for examination. In the early stage success depended on puncture of the swollen gland itself, which had to be defined and steadied between the thumb and fingers of the left hand whilst performing the small operation. In the later stages this was less important, as the exudation round the gland contained abundance of plague bacilli. The amount of fluid obtained was rarely more than a few drops, and in some instances, when none appeared in the barrel of the syringe, one could still obtain enough from the channel of the needle. It was also possible, in some cases, to express a drop or two of fluid out through the needle track by gently squeezing the bubo, and with the small quantity so obtained to make cultures and smear preparations as in the case of blood. The fluid obtained at these examinations was seldom purulent, but usually a greyish coloured mixture of lymph and blood, containing innumerable plague bacilli. Our experience was similar to that of other observers, in that bacilli were relatively scanty in pus from suppurating buboes. Specimens of blood rarely showed plague bacilli, save when taken from patients who died within twenty-four or forty-eight hours afterwards, and even in these the micro-organisms were usually few, and discovered only after long search. The cultures from blood were more useful so far as recovery of bacilli was concerned, but the patient was generally dead by the time one could examine and pronounce upon the growth. It afforded confirmatory rather than diagnostic assistance, and this applies also to guinea-pigs inoculated from the small clots often found on the culture tubes inoculated with the blood. I have nothing special to remark with regard to sputum, as very few samples came under my notice.

I need not in this place enter upon any detailed account of the laboratory operations and their results. Our observations were in accord with the authoritative descriptions, and are fully recorded in the official report. Suffice it to say, therefore, that they usually afforded valuable assistance, but occasionally failed to throw any light upon the case, owing to practical difficulties in the way of obtaining suitable specimens. A bacteriological diagnosis was specially serviceable to us at the beginning, to determine individual cases, and establish the existence of the epidemic. Later on the cases were clinically diagnosed with increased confidence, and a bacteriological examination required only in doubtful or important instances. Our experience of it was that with care it did not mislead, but we had to recognise limitations to its practical utility.

(II.) The Mode of Dissemination.

With reference to the epidemiological aspect I can only in this place present a brief summary of the evidence obtained concerning the origin and mode of spread of the plague amongst us at Sydney, and again refer you to the official report for details.

Our first patient fell sick on January 19th, 1900; the second about four weeks later; the third about four days after the second; and then followed the rapid succession of cases comprising the epidemic. We ascertained no reason to doubt that the case reported in January was actually the first that occurred in Sydney. Examination of the monthly mortality statistics for January, 1900, December and November, 1899, showed no essential differences between them and the data for corresponding months of previous years. Enquiries at the hospitals, and of medical men with large practices afforded no indication of the existence of any excess of patients with buboes (ambulant cases) during the months in question. I have no doubt that any such circumstance would have been noticed, since medical men were fully alive to the possibility of meeting with plague, partly on account of the prevalence of that disease at Noumea (four days journey by steamer) and partly because of the comment aroused amongst them by the reported occurrence of a case at Adelaide. But neither at the time nor since has any member of the profession asserted his cognisance of a previous case in Sydney, and we did not succeed in gleaning even a suspicion that any person sick with plague had come to the Colony from abroad. Consequently, although experiences elsewhere have been such as to induce caution in expressing assurance as to the primary incidence, all the evidence we could gather was uncompromisingly to the effect that the first person to acquire plague was the man reported to the Department of Public Health in January.

The fact that this first patient really had plague was vouched for by clinical and bacteriological evidence of such a convincing description as to place the diagnosis beyond doubt But we were quite at a loss as to the manner in which he had become infected. He had never been away from the Colony, and careful investigation failed to reveal any receipt or handling of possibly contaminated articles. The one suggestive fact in this respect was that he was a carter in the employ of a shipping firm, and his business took him to certain wharves which were the scene of the next incident in the epidemic, and in other respects a very important feature of it.

Immediately upon the occurrence of the first case a proclamation was issued, in the official Gazette, in the public press, and by printed placards posted up in all parts of the city. requesting information with regard to sickness or unusual mortality amongst rats. It was not many days before we were advised by a customs officer that the rats were dying in great numbers upon one of the wharves, and on the afternoon of the same day on which this report was received we obtained fifteen rats from the wharf—some dead, some sick, and some apparently healthy. *Post-mortem* and bacteorological examinations showed that no less than seven of them had plague. We immediately set men to work to trap and kill the rats, and many lots of them were examined in the laboratory with sometimes positive, sometimes negative results. Enquiries made of government officials employed about the wharves—customs officers, fruit and grain inspectors and others, elicited the information that the dead bodies of rats to an unusual amount had been noticed for some weeks before our attention was called to the matter. The epizootic amongst the rats was thus indicated to have commenced at a date prior to the occurrence of the first case in a human being. As already stated this patient had been upon some of the wharves in the vicinity of that upon which the plague rats were discovered.

The next episode was the death from plague—bacteriologically confirmed—of a man who resided immediately opposite this very wharf, whilst the third patient was a clerk employed actually upon it. The series of cases which next followed, with a remarkable exception to be mentioned directly, were all in persons who either lived in, or frequented, the vicinity of the wharf in question. The exception referred to was that of a family living miles away from the wharf, and in which, within two or three days of one another, the father and three children fell sick with plague. They were very poor people, and occupied a dirty dwelling swarming with vermin, situated adjacent to the municipal garbage tip. The children were said to be in the habit of playing upon the tip, and the other members of the family were also believed to have dealings with it. At this tip there was deposited the rubbish collected, amongst other places, at the wharf already mentioned, and the presumption is that the infection of this particular family was acquired from some article, rat, or vermin carried thence by the scavenger's carts. So that these cases also were associable with the wharf and its plague rats, and its locality remained for a period of several weeks the only one from which infection appeared to be derived.

Of course the people becoming infected in this area fell sick and were found by us in various other parts of the city and suburbs, but it was some time before what may be called indigenous cases arose in any other place. There was a spread continuously along the water front, and for some little distance inland into the city; but it was not till later that cases appeared in persons residing outside the area of connected extension, and having no relationship with it. Such cases occurred in women and children, or in men who had not been away from their district within a time covered by the period of incubation of plague. These separate areas in which plague thus appeared to obtain, as it were, an indigenous foothold, were not specially those at which persons infected at the primary (wharf) focus had fallen sick. Very often the indigenous cases were the first or only ones that occurred in them. The one fact indicative of the possible mode of importation of plague into such areas was that in nearly every one of them we sooner or later captured rats, which on examination at the laboratory were found to be infected with plague. They were

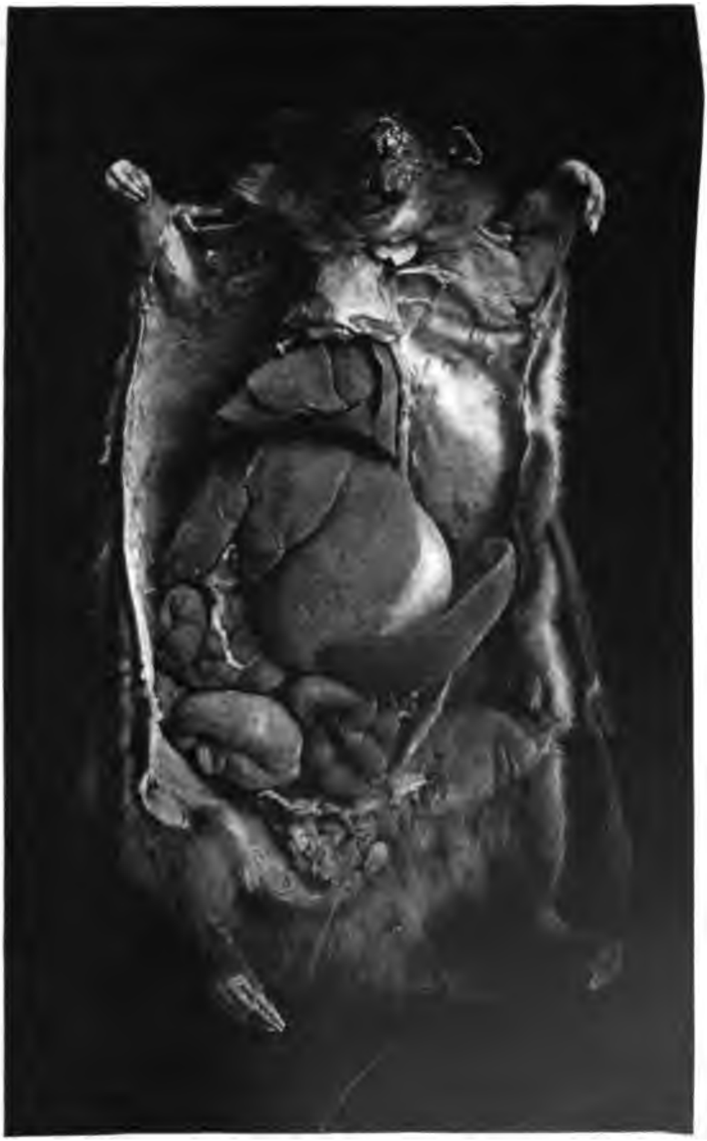

PLATE 1.

PLAGUE RAT NATURALLY INFECTED, SHOWING GREAT ENLARGEMENT OF THE SPLEEN AND LIVER.

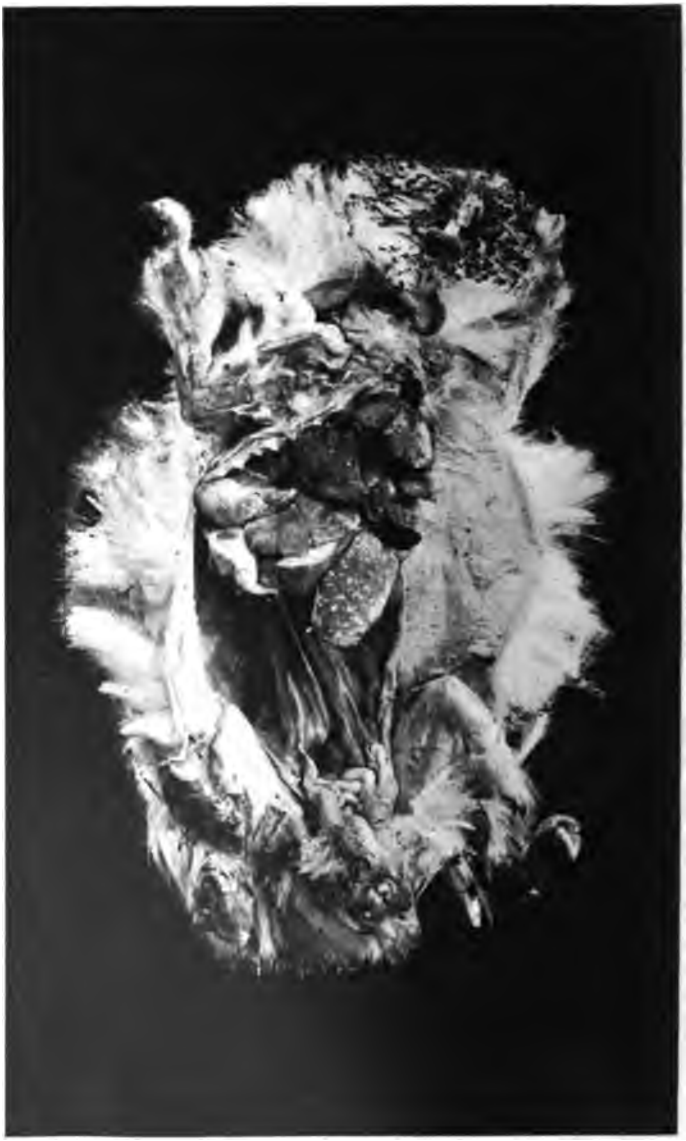

PLATE 2.

GUINEA PIG DEAD AFTER INOCULATION WITH PLAGUE (PARTLY DISSECTED, LIVER AND ALIMENTARY TRACT REMOVED) SHOWING MILIARY NECROTIC SPOTS IN SPLEEN AND HÆMORRHAGES IN LUNGS AND HEART.

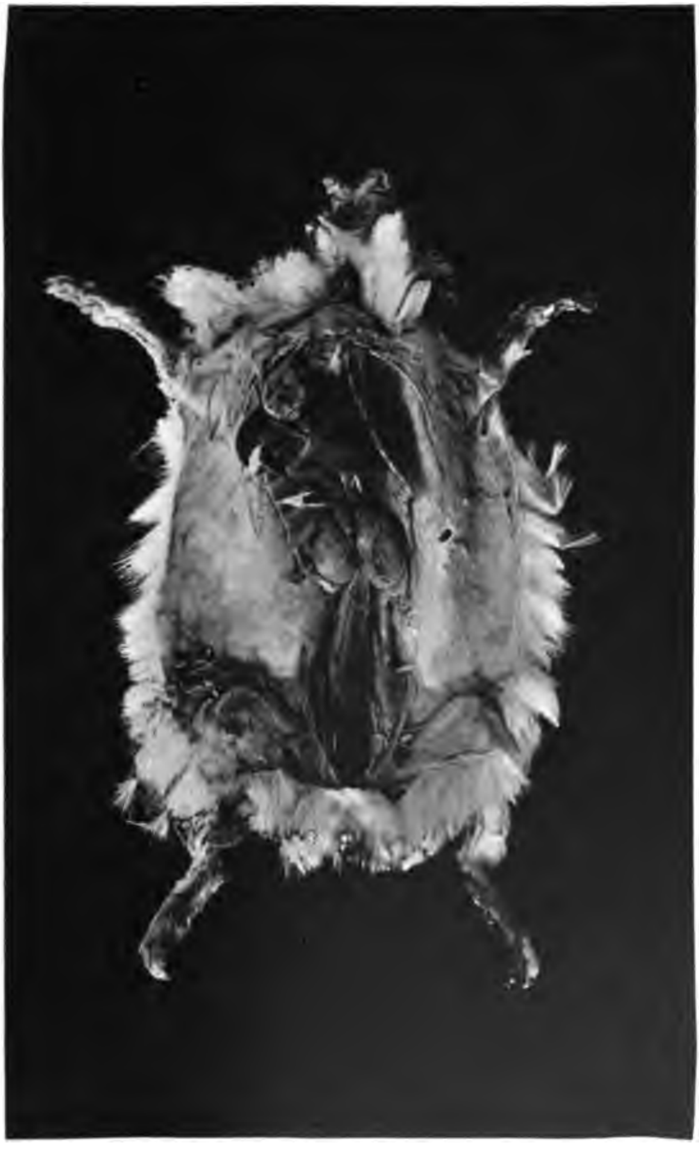

PLATE 3.

GUINEA PIG DEAD AFTER INOCULATION, DISSECTED TO SHOW SWELLING OF THE SUPRARENAL BODIES AND HÆMORRHAGE IN KIDNEYS, AND BUBO IN RIGHT GROIN.

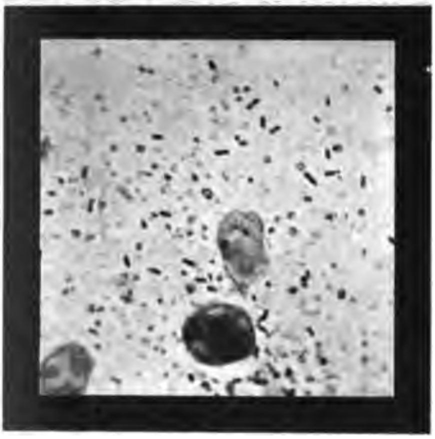

Fig. 4.
PLAGUE BACILLI IN FLUID FROM BUBO.

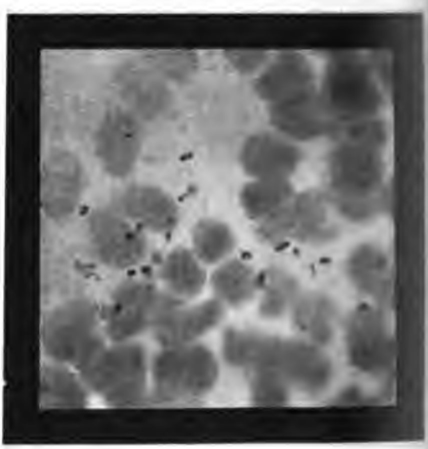

Fig. 5.
PLAGUE BACILLI IN FLUID FROM A CARBUNCLE.

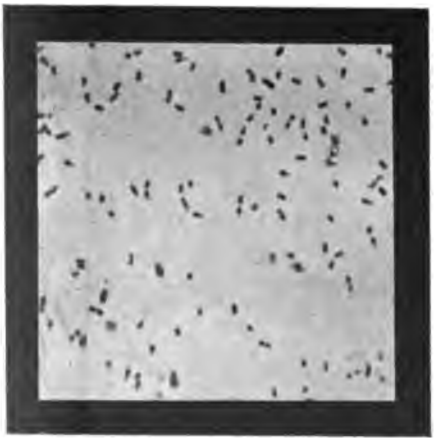

Fig. 6.
PLAGUE BACILLI FROM AN AGAR CULTURE.

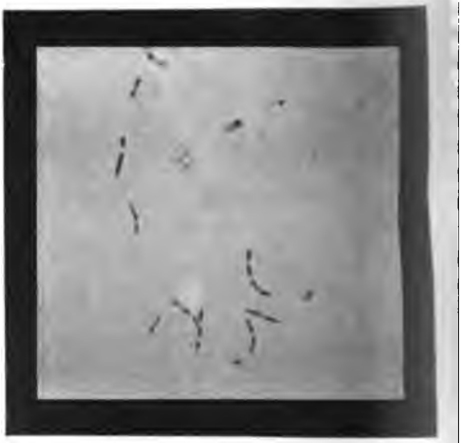

Fig. 7.
PLAGUE BACILLI FROM A BROTH CULTURE.

PLATE 4

taken not only from the locality, but in a few instances from the actual houses in which plague occurred. In this and in other ways it became impressed upon us that the incidence upon human beings was practically always associated with disease of the rats. We were confronted, as others have been, with the triangular problem in the transference of plague which this dual existence of the disease involves, viz., infection from animal to animal of the same species; infection from man to rat; and infection from rat to man.

The one clear fact in our epidemic was that human beings were not becoming infected directly from one another. We had occasionally two or three cases in the one household, or amongst the employees of a single business firm, but almost invariably the attacks were either practically simultaneous or separated by such an interval as excluded the possibility of infection by direct contact. In most instances, however, there was but one case in a family or staff, and there was an entire lack of immediate relationship between it and any other of the epidemic. On the one hand the patient had not seen, nor been near, and often did not know any infected or possibly infected person, and on the other no secondary cases arose in his household or elsewhere as the result of his own illness. It very often happened that patients fell sick in remote suburbs or in country towns to which they had gone by railway; circumstances that could not fail to result in the detection of any secondary case arising from them. But neither in these, nor in any other instances, was there the least evidence that one person had acted as the source of infection for another. There was no ground for even a suspicion that our epidemic was being maintained by any process of direct contagion between man and man.

We did not observe any case in which the infection could be ascribed to handling or receipt of contaminated articles. The only evidence bearing upon this point was that some three or four, out of as many thousands of the men engaged in cleaning up the infected areas, acquired plague. They were working in different places, handling different materials, and fell sick at different times, so that they did not serve to indicate any particular articles as infectious. Moreover, as they were employed in places harbouring infected rats, not necessarily those contaminated by human beings, they were on the same footing as other patients not engaged in the cleaning operations. We have, therefore, no evidence that infection could be acquired by any process of indirect contagion. It thus came about that the disease was not observed to spread either directly or indirectly from man to man.

With regard to the natural means by which the disease was kept going amongst the rats, we have no very definite evidence to offer. Experimentally, however, they succumbed to inoculation, and to pricks and scratches with infected instruments, such as might be received from teeth or claws in quarrels with fellow rodents. Encounters of this kind were frequent amongst rats kept in the laboratory cages, and sometimes culminated in one of the party being reduced to a few claws and a backbone. In captured rats we often found bites on the ears and nose, and if these had been received during an argument over the body of an infected confrere, they would no doubt have been the means of introducing plague into their recipients. But from our examinations this did not appear to be a common mode of infection, since we never found true buboes in captured plague rats. There is a possible fallacy in this inference, since plague is apt to assume a septicæmic form in rats, and hence there would not be a bubo. But swelling of the nearest lymphatic glands, accompanied by hæmorrhagic exudation, was usually produced by experimental inoculation, and consequently one would expect it to have been seen if the natural infection was acquired in a similar way. We found that rats could be infected by feeding, the experimental animals being kept in glass jars by themselves, and given soft material, bread or biscuit soaked in cultures of plague bacilli, or the spleen and liver of rats or guinea-pigs recently dead from plague. Feeding with the organs was much more successful than feeding upon cultures, the latter sometimes failing to produce infection. In one instance we found a large mesenteric gland in a captured rat, and in one of the experimental rats the whole group was swollen, matted together and embedded in hæmorrhagic exudation, indicating that infection had been acquired through the gastro-intestinal tract. Owing to their cannibalistic proclivities, possible injuries from bones, and the probability that a comparatively helpless sick animal would be regarded a fair object for attack, feeding may be supposed to contribute something towards the maintenance of epizootic plague in rats. We never succeeded in producing plague in rats or other experimental animals by placing them in the uncleaned cages and jars in which animals were dying or had died from plague. I may here remark that our laboratory operations were never attended by accidental conveyance of infection amongst the animals more or less closely associated in the various experimental investigations conducted by us. We risked upon two occasions the scattering of numerous fleas over an infected and sick rat, to test whether these vermin ould convey the disease to a healthy one kept in the same e, but separated by a double wire screen with wide meshes, as mentioned by Simond. The experiment was negative on both occasions, and I am glad to say that we had no further acquaintance with the particular fleas used in the experiment. We did succeed in setting up infection by means of an emulsion of fleas taken from a very sick rat captured at a hotel from which we had just taken a girl suffering from plague. The bacilli were detected by microscopic examination of the emulsion, and injection of a few drops of this fluid into a guinea-pig produced plague fatal in the usual time; the animal showing the usual *post mortem* appearances including a bubo; and its viscera yielding micro-organisms, with subcultures of which we were able to produce plague in other animals. We are therefore able to make this small contribution in favour of the statement that plague bacilli may be found in or on fleas, and such vermin may thus be the means of disseminating the disease amongst rats. Briefly summarised, our experiments seemed to indicate that the disease might spread from rat to rat by inoculation through wounds from infected teeth or claws, or sharp points of bone in their food, or by vermin, and by feeding upon the viscera of infected animals. It appeared also that feeding upon infected food of other kinds, such as biscuit or bread deliberately soaked in culture would occasionally result in infection, but usually did not, and no positive result was obtained by feeding upon the food merely soiled by a sick animal.

Our epidemic does not furnish any clear evidence on the question of the transference of plague from man to rat. That the excretions of plague patients contain bacilli, and that rats feed upon such infected excreta in the sewers, suggested itself to us as a possible mode of such conveyance. To a certain degree the extension of the primary focus was along rather than across main sewer lines, and the secondary indigenous foci occurred on small reticulations connected with the larger ducts, suggesting that rats may have picked up the infection from material carried along the sewer. But this did not cover all cases, and the time relationship was not in keeping with such a theory. It appeared rather more probable that the sewers constituted highways along which infected rats migrated, and thus disseminated the disease from the primary focus. Meanwhile I need only say that we did not observe any clear facts indicating a spread from man to rat.

The last point in the problem under consideration was transference from rat to man. I have already stated that at the wharf in the neighbourhood of which the bulk of our early cases occurred, mortality amongst rats preceded the incidence of plague upon man; and that in other indigenous centres plague rats were almost invariably discovered. Many of our patients had actually handled dead rats, others had seen them about their houses and premises, or what seemed to impress them much more strongly, they had smelt them. These facts, considered in conjunction with the entire absence of immediate or mediate contagion, induced us to believe that rats were the sources of infection for human beings. As regards the exact manner in which the microbes obtained entrance into the bodies of our patients, the evidence was to the same effect as that obtained elsewhere, namely, that they were infected by inoculation. The preponderance of femoral buboes indicated that the actual site of inoculation was usually somewhere on the lower limbs, but the suggestion of oriental epidemiologists that infection occurs with dust entering small unnoticed wounds on the bare feet did not apply to our cases, as our people all wear boots. We never had any patient who could be supposed to have received his infection through wounds—cuts or abrasions. We had therefore to fall back upon the theory promulgated by Simond and others, that fleas were responsible for the actual transference of the causal bacteria. We could nearly always find fleas upon the rats forwarded for examination. This was so commonly the case that as a measure of self-protection we adopted the practice of using chloroform to stupefy the fleas, and then burnt the fur off the rats, and so destroyed the fleas before allowing the cages to be brought into the laboratory. The number of fleas upon rats specially examined was very variable, but sometimes there were a great many upon sick rats. We had no difficulty in obtaining a dozen fleas from such a rat for the purpose of making the emulsion already mentioned. I am not prepared with the names of the species of fleas found on rats, as I knew no one in our Colony who could advise me upon that point. But some of the creatures were large, like those found on dogs; and others were small, showing on comparison no difference that I could detect from fleas obtained from human beings. It has been asserted by Galli-Valerio that fleas from rats will not bite mankind, but this has been disputed by other observers, and I can at least vouch for the fact that rat fleas promptly make for one's hands when a rat is manipulated. I need scarcely say that we did not wait for a practical demonstration as to whether they would bite. For my own part, I am inclined to believe that although fleas have a predilection for particular species of animals, they will go upon others and often sample them by a bite or two, before returning to the host best fulfilling their epicurean inclinations. It is said, and appears probable, that the fleas will remain upon rats until their particular host dies. The circulation then ceasing and the body becoming cold, the fleas are compelled to search elsewhere for their accustomed pabulum. They may probably seek another rat, but on their journey invade some other animal, perhaps man. On this point I may mention that we were informed that at the time the rats were dying in large numbers upon the wharf to which attention was called above, the fleas there were so numerous that the labourers tied strings round the bottoms of their trousers to protect themselves against the onslaughts of the vermin. Some of our patients recollected being bitten by fleas at a date consonant with an incubation period of three to five days. The majority had no such remembrance, but the social status and domestic habits of most of them were not such as to invest a little incident of that kind with remarkable novelty. They were often oblivious of having been bitten when their skin showed abundant evidence of it. In several instances we found the tiny blisters or phlyctenules mentioned by Simond and others as marking the actual site of inoculation by fleas, and in a smear preparation from one such case, we found micro-organisms having the microscopical characters of plague bacilli. On the whole, therefore, we became possessed of some facts which seemed to show that Simond's contention was not altogether hypothetical.

In view of all the evidence,—positive as regards rats and fleas, and negative as regards other agencies,—we were compelled to believe that our people were being infected from plague rats, probably through the intermediation of plague fleas or similar vermin. The liability of cats to plague, as mentioned by Lorans of Mauritius, and confirmed by the instance at Sydney, may perhaps be regarded as an additional condemnation of the rat, in view of the association between the two species of animals.

We did not succeed in discovering how the rats first became affected. The Port of Sydney is in frequent communication with infected places in China and India, and also with the Sandwich Islands and Noumea, where plague was prevalent at the time of our outbreak. But there was no evidence that any contaminated article or plague rats reached our shores from any of these places. The only fact bearing upon the point is that amongst the rats forwarded to the laboratory for examination there was a large rough black-coated rat, different from the local rats and said to be an Indian species. This particular specimen was perfectly healthy, but if it really be a foreigner, its presence in Sydney paves the way to the assumption that infected rats may have reached us by some similar means. Unfortunately, up to the present there has been no opportunity of obtaining an authoritative opinion as to the species of rats already established in Australia, so that no special significance can be attached to the incident just mentioned.

III.—Application of Preventive Measures.

It is a curious fact, mentioned by Hirsch as regards former epidemics, and by several modern writers with respect to the present pandemic, that there has often been exhibited a tendency to deny the existence of plague on its first appearance at any particular place. It was not surprising therefore to find that the attitude assumed by our own community was at first one of manifest incredulity. The press, the public, and the medical profession, were strongly disinclined to accept our pronouncement on the first case. The bolder spirits amongst them did not hesitate to accuse the authorities of error without, however, taking the trouble to ascertain the facts for themselves. Fortunately the evidence with regard to that case was so clear and convincing that the officials of the Department of Public Health were able to maintain an unwavering adherence to their diagnosis, and to meet the storm of ridicule by firm insistance on the application of the requisite preventive measures. The discovery of the plague-stricken rats was the incentive for the organisation of a special service to cope with the epidemic thus suggested as imminent, but owing to the solidity of the passive resistance, our efforts in this direction made but slow progress at this time. For a period of about six weeks we were exposed on the one hand to adverse public criticism, and on the other to hesitancy in the acceptance of our recommendations. This undesirable condition of affairs underwent an abrupt change when six cases occurred, and terminated fatally one after the other in rapid succession. The former disbelief gave place to excited appeals for guidance. There was no longer any question of excessive zeal on our part, on the contrary we were overwhelmed by hysterical advice as to what ought to be done. With the melancholy satisfaction derivable from this long delayed removal of opposition, we set ourselves to the arduous task imposed upon us, and proceeded to a more elaborate campaign against the pestilence.

Briefly stated our procedure was as follows: On receipt of a report from a practitioner of a case of manifest or suspected plague the patient was immediately visited by a medical officer of the Department. If the case proved to be plague, the inspector informed the sergeant in charge at the nearest police station, who thereupon dispatched a constable to take charge of the house and prevent any person from leaving it. The medical officer also telephoned from the police station to the Department, and by this means a nurse and ambulance were sent to remove the patient, and a waggonette for other persons or contacts. The patient was conveyed to the Quarantine Hospital, and the contacts to the observation enclosure within the Quarantine Station. Sometimes the removal was suspended for twenty-four hours or so pending the result of bacteriological examination of specimens taken to the laboratory of the Department by the medical officer. After removal of its occupant the house was locked up and left in charge of the police, who admitted the disinfectors and afterwards looked after it till the return of the contacts. Business premises were not closed unless at least two employees had become plague-stricken. It was then treated in the same way as a private house, but otherwise disinfection was carried on, one floor at a time, whilst business remained in progress. When an infected area became defined, a proclamation was issued giving twenty-four hours notice of suspension of business within certain prescribed limits. After that time it was surrounded by a cordon of police, and a gang of men turned in to clean up the whole area. Meanwhile efforts were made to destroy rats, by the employment of professional rat-catchers and by stimulating private enterprise to that end. Finally we carried out public inoculation with Haffkine's prophylactic obtained from Bombay. These various operations were kept going for a period of seven months. Their administration involved no slight effort on the part of the authorities, and their execution necessitated the organisation of special staffs for the different branches of the work.

Under ordinary circumstances the medical staff of the Department of Public Health were two (now three) specially qualified hygienists; but there were in addition two Medical Officers of Health, more or less closely in touch with the central office. On the outbreak of plague the medical staff was increased to seven members; two stationed at the hospital, three engaged in regular visitation of the patients, and two mainly occupied in administrative and other general matters connected with the epidemic. From time to time we had the assistance of medical visitors from other colonies who came to gain experience, and of many medical men practising in Sydney, but these were chiefly employed in connection with the inoculation of Haffkine's fluid. I must here remark that, once convinced of the reality of the plague, the medical profession generally gave courteous and loyal support to the Department.

The discovery of plague rats was accepted in the microbiological laboratory as a signal to clear the decks for action, and when the demand came for bacteriological diagnoses and experimental observations the staff were ready and prepared to meet it. The work done in this branch of the Department was so exacting that for a period of three or four months the assistants were in the laboratory every day—Sundays, highdays and holidays included—from 8 o'clock in the morning till nearly midnight.

The general office was inundated with letters and besieged by callers, requesting advice, assistance, employment, concessions, or interviews; instituting protests or claims for compensation; seeking information concerning the sick or their effects; propounding schemes for the eradication of the plague or the treatment of the sick; and otherwise materially augmenting what may be termed the legitimate business connected with the epidemic. To meet the stupendous increase of work additions had to be made to the clerical staff in nearly every branch of the office.

The preventive measures included the removal of both patients and contacts, an action which, in the absence of statutory sanction, had to be carried out under Executive authority. For although there was ample power under the Quarantine Act and regulations to prevent a person with plague from entering the colony by sea, there was none to enable us to deal with a case arising within our own boundaries. The Public Health Act covers at present only notification, and it was our hope that in time this would furnish the means of educating the people up to the point of accepting an Isolation Act. The consequence was that we had no legal right to remove the patient, but the emergency was held to justify this course, subject to subsequent confirmation by the Executive. As a matter of fact there was never any real difficulty about the patient. The community came quite solidly to the view that he was better isolated, and resistance, though occasionally threatened, was never practised. But it was otherwise with regard to contacts. They, being quite well, naturally enough objected to being taken from their homes, and the fact that those removed invariably remained unaffected, was quickly brought forward as an argument for the abolition of our practice. For our own part we recognised that there was room for debate upon this question, and were prepared to substitute isolation within their own houses, and daily visitation for a period, in lieu of their removal. But we asked for discretionary powers in this respect, pointing out that a large isolated house was less dangerous and more easily disinfected than the small crowded dwellings occupied by the poor. This proposal was rejected as a matter of political expediency, so we had to accept the next best thing, and remove all domiciliary contacts indiscriminately. This procedure worked smoothly enough when it concerned five or six persons in a private house, but the evacuation of hotels and large boarding-houses, with forty or fifty contacts, at a moment's notice was not accomplished without considerable strain of the transport and commissariat. However, it was done as a matter of course, and as the Quarantine Station at Sydney is a delightful and picturesque place, the procedure eventually came to be regarded as having provided a very enjoyable excursion for many deserving citizens.

The means of conveyance comprised an ambulance and waggonette service, and a flotilla of steam launches. By the former the patients and contacts were conveyed from their houses to the Quarantine Depôt and Wharf at Sydney, and by the latter they were taken about six miles down the harbour to the Maritime Quarantine Station at North Head. The ambulances and drivers were drafted from the regular staff of the (Government) Coast Hospital at Little Bay near Sydney, and accomodated at the Depôt, where additional quarters and stabling were erected for the purpose. Each ambulance carried a trained nurse and the usual equipment. The steamers comprised the regular service launches and others specially chartered, and were provided with shelters and other arrangements for the welfare of the patients. Although apparently complicated, the arrangement worked quite steadily when once organised.

On arrival at the Quarantine Station the patient was transferred to the permanent hospital buildings situated on a promontory and well isolated, whilst the contacts were conducted to apartments in pavilion houses on what is known as the healthy ground. The general management of the station was under the immediate control of the Superintendent of Quarantine and the permanent officers of his staff, assisted by hands temporarily employed during the epidemic. The resident hospital staff comprised two medical men, a dispenser, and the necessary complement of trained nurses and wardsmen. All the nurses were officers of the Government Coast Hospital or Quarantine Services, who, with the devotion characteristic of members of their profession, spontaneously volunteered for plague duty. In addition to the resident staff the hospital was visited regularly by a senior member of the medical profession, and frequently by the medical officers of the Department of Public Health. Facilities were afforded for medical men to visit the hospital and familiarise themselves with the disease.

The disinfecting staff consisted of gangs of men acting under the guidance of trained quarantine officers; the whole of this business being under the supervision of the Medical Officer of

Health for Sydney. The methods of disinfection practised comprised fumigation with sulphur or formalin; spraying and washing with corrosive sublimate or carbolic acid solution: clearing out and lime whiting of outside premises; steam disinfection of articles exposed to contamination or their destruction by fire when they were not worth preserving; and renovation where such appeared to be necessary. The Public Health Act enabled us to compel owners to repair structural defects, and its stringent application resulted in the institution of new drains and modern sanitary fittings in many places sadly in need of them. As opportunity offered, or could be made, ferry boats and coasting steamers were also dealt with by the staff here under consideration.

The procedure in dealing with proclaimed areas consisted as stated, in a general clean up by large gangs of labourers temporarily employed for the purpose. The number so engaged averaged about 2,000 men, acting under the direction of an experienced contractor, and the Sanitary Inspector of the Department of Public Health and his assistants. In special cases they received the advice or direction of the medical officers, engineers, and architects in the Government service. The object sought was to make a clean sweep of the areas dealt with, removing from them everything that could be regarded as defective from a hygienic point of view. The men entered and cleaned up every street, lane, house and premises; sweeping, repairing, washing and renovating good structures, destroying old or tumbledown premises, clearing out and levelling yards, tearing up old and laying new drains, and generally doing anything of the kind that suggested itself as a means of effecting cleanliness. The combustible rubbish was burnt at bonfires in the streets, and such as could not be so treated was loaded into punts, towed off beyond the harbour, and cast away several miles out at sea. It need scarcely be said that this measure got rid of an enormous amount of rubbish, and effected material improvement in the areas dealt with one after the other, covering in the aggregate a large part of the city. Of course it was not accomplished without imposing individual hardship, but in such instances the sufferers received adequate consideration from the Government. As the cordon of police posted round the area in which cleansing operations were in progress restricted ingress to authorised persons, and incidentally prevented the residents inside from getting out, provision was made for their maintenance at the public expense during the period of their incarceration. The interruption of business was the subject of many protests and claims, but for the most part these received little sympathy from the community, the general impression being, by that time, that the operations represented salutary efforts towards sanitary reformation. Finally the Government resumed the greater portion of the water front, and intend replacing the present irregular wooden wharves with stone and cement structures, such as will remain cleaner and afford less harbourage for rats.

During the whole time the work of destroying rodents was stimulated by every possible means. Professional rat-catchers, real or alleged, were engaged, poison was supplied free of charge, and private efforts inspired by a reward of first twopence, then sixpence, per head, per rat, delivered at the destructor depôt. Lengths of sewers were blocked up and fumigated with sulphur, the subsequent flushing carrying down numerous carcases of rats killed by the fumes. The same method was successfully applied to the holds of ships. The use of baits soaked with cultures of bacillus typhi murium (Loeffler) or Denysz' bacillus, did not prove efficacious as rat exterminators. It is true that rats commonly disappeared for a time from places where such baits were laid. But they were not found dead, neither on the surface nor in the runs, and usually reappeared in the course of two or three weeks. On one occasion their apparent depletion at one place was coincident with great numerical increase at another about a mile distant, thus indicating that the rats had not been destroyed but had merely migrated. They afterwards gradually returned to their former haunts. It may also be mentioned that rats became so scarce upon the infected wharves as the epidemic progressed, that it was difficult and sometimes impossible to obtain specimens for examination. This illustration of the fact that these rodents will migrate from places where they are being injured or harassed, suggested the possibility that our efforts might result in the dissemination of plague by scattering infected rats. But upon reflection that sooner or later they would scatter of their own accord, as an instinctive means of ridding themselves of their epizootic, we felt justified in encouraging rather than uselessly trying to check this natural process of elimination of the disease. Besides, from our point of view, every rat killed was one possible source of infection the less, and we accordingly persisted in destroying them by every means in our power. I cannot state the number of rats that met their fate by these efforts, as the returns had not been made up when I left Sydney, and the war against them was still being carried on, but it was said that something like 100,000 had been accounted for up to that date.

The last point to which I will call attention is the public inoculation with Haffkine's prophylactic. As part of our scheme of preparation for a possible outbreak of plague, we were in possession of a small quantity—about 300 doses—of the prophylactic when the first case occurred. This was used to inoculate the contacts with this case, and the members of the staff of the Department who would have to deal with it, and any others that might occur. At once a cable message was dispatched to India requesting a further supply, and in response to it 25,000 doses reached us about five weeks later. The same cablegram arranged for a regular monthly consignment until further notice. On receipt of the fluid, it was announced that any person could be inoculated free of charge on application at the offices of the Department. There was no great response at first, but as cases of plague continued to crop up, and the public became assured by the experience of friends or prominent persons that inoculation was not synonymous with sudden death, the number of applicants rapidly increased. In the course of a week or two the offices could not hold the crowds that collected. The corridors, staircases, and approaches were crammed with people pushing and struggling to reach the inoculators; damaging each other and smashing the furniture and fittings of the office. Members of the staff who were outside could not get in, and those who were inside could not get out; the conduction of any other business was out of the question. The affair culminated in the office being cleared by the police and the operations being transferred to a large exhibition building, with a police guard to control the assemblage. With the object of securing the utmost protection from the use of the prophylactic it was announced that only persons residing or occupied in the infected areas would be inoculated, and these had to produce written testimony of their eligibility signed by clergymen, employers, or well-known persons. For days the attendance was far greater than could be provided for, although we frequently treated twelve to fifteen hundred persons per day. This exciting episode of the epidemic continued until we had used up two consignments of prophylactic, when delay in the arrival of the third afforded us a much-needed respite. On recommencing operations the epidemic had begun to subside, the panic ceased, and the attendance gradually fell off until we had no further applications.

The actual inoculation was carried out in the following way: The back of the bared upper arm of the patient was washed with lysol solution by an attendant, the inoculating physician injected the fluid subcutaneously, and a second attendant immediately placed a small square of Mead's plaster over the puncture. The two attendants here mentioned were senior medical students, the physician a practitioner in the city whose temporary services were retained by the Government. There were usually four to six physicians operating at a time. The instruments and prophylactic were in sole charge of the trained laboratory assistants, who attended to the preliminary sterilisation of the apparatus, poured out the fluid and filled the syringes with strict regard to bacteriological cleanliness. The syringes were provided with platino-iridium needles, which were sterilised by heating to redness in the flame of a spirit lamp between each inoculation. To the technical skill and careful observance of instructions is to be attributed the total absence of untoward results in the many thousands of persons inoculated under the exacting conditions above described.

The doses of prophylactic given were in accordance with the directions upon the bottles. The after effects were more or less fever and malaise for twenty-four or forty-eight hours, and a varying degree of cellulitis of the arm enduring for about a week or more. In some cases the febrile attack was sharp, and followed by langour for a few days, but as a rule it did not prevent attention to business. The cellulitis of the arm was sometimes painful for several days, and occasionally a small abscess formed at the site of inoculation. In three such cases that I had an opportunity of examining the small amount of pus was sterile. Beyond what is here mentioned the inoculations gave rise to no trouble, and were not attended by any serious inconvenience to the patients.

It is difficult to pronounce as to the efficacy of the process, in view of the other vigorous measures taken to subdue the epidemic. Some six inoculated persons subsequently acquired plague, but they were all mild cases and recovered. As the proportion of deaths in other persons was one in three, it is to be presumed that the previous inoculation had effected some satsifactory modification. There was in addition the advantage of its moral effect on the populace, who were considerably quietened by the feeling that they had been afforded every possible chance of protection against the disease.

From what has been said it will have been gathered that no efforts known to us were spared in combating the epidemic. The measures taken involved great expense, and an excessively arduous devotion to duty on the part of those charged with their execution. Happily we had the consolation of seeing the epidemic decline and come to an end, which I sincerely trust will prove to be a permanent one. In conclusion, I have to express my appreciation of the honour accorded to me by the Committee's request for a paper, and to thank my audience for the patient hearing of what I feel to be an inadequate recognition of it. I am above all conscious that I have occupied your attention this evening for a time unduly long, but I hope you will regard this as inseparable from a desire to place at your disposal, as fully as possible, the information acquired by us at Sydney on a subject of mutual interest and importance.

[*For discussion on this paper, see page* 583.]

"*Plague in an Indian City,*" by S. M. KAKA, D.P.H., F.C.S., Medical Officer of Health, Karachi, Scinde, India.

Read at Sessional Meeting, Dec. 12th, 1900.

THE difficulties experienced in administering plague measures in an Indian city where the conditions under which the people live are entirely different from those prevailing in the West, are very great.

I have had much to do with plague during the last four years in an Indian city of considerable importance, Karachi, the capital of Scinde in India, ranking next to Bombay as a portion of the west coast, near the great Indus river. Karachi is a seaport town. It would not be possible to state accurately at present its exact population; roughly, it may be put down at 115,000 inhabitants, comprising some 40–45,000 Hindus, 45-50,000 Mahomedans, with a sprinkling of Europeans, Eurasians, Parsis, Jews, Native Christians, low castes, etc.

The city has passed through four epidemics from the end of the year 1896 to about the middle of the present year, with over 13,000 recorded cases of plague and some 10,000 deaths.

The symptoms and clinical characters of the lesions are too well known to call for any remark. The commonest forms known are the bubonic and pneumonic; but there are certain obscurer forms, without any outward and visible symptoms in which death more or less sudden occurs. I have seen persons who were apparently hale and hearty in the morning dead before the evening of the same day during a raging epidemic. So that the premise—from the point of view of the plague sanitarian—that every death during a plague epidemic, unless properly accounted for, should be treated as one from plague would not be wrong. It has to be remembered that every plague infected house requires particular treatment. We know what to expect if any such escape. I am sorry, however, to state that a number of houses could not be attended to, not because there was sometimes difficulty in diagnosis, but because the people would not notify correctly the cause of death, would have nothing to do with medical men and medical aid, and among other reasons, to avoid manipulation of their houses would even conceal corpses, or throw them in lonely spots or vacant houses in the neighbourbood. To further thoroughly understand the difficulties one must be fully conversant with the habits, customs, beliefs, and prejudices, social and religious, of the people. They differ considerably in different castes, and in different sects of the same caste. The necessity of isolating a person suffering from an infectious disease is generally understood in the West, and the value of hospital treatment appreciated. The average Indian, on the other hand, when a plague patient is removed to hospital, readily believes that the person has been taken away to be poisoned. In fact, this measure together with some other factors contributed to the plague riots in some parts of India.

A common custom when a person falls ill is for the friends and relatives to congregate around the sick bed, often in great numbers, no matter what the patient may be suffering from. In the earlier days of the plague I have seen often twenty and thirty persons around a dying plague patient. These, of course, as they scatter to their own homes, form so many different foci of infection; some become directly inoculated with the poison of plague on account of the practise of moving about houses with bare feet.

Again, religious ceremonies have to be performed in the house after the occurrence of death, and the friends and relatives must sleep on the ground floor where the corpse was kept before its final disposal. Should death occur after sunset, especially among Parsis or Hindus, the corpse must perforce remain over-night in the house, the mourners, especially women, keeping vigil around it.

It would not be possible to isolate or disinfect the corpse of a person dead from an infectious disease in India.

Then as to the measures:—a sanitarian knows what to do when a town is invaded by an infectious disease of the nature of plague. To do any good, isolation of the sick, segregation of contacts, cleansing and disinfection, and the like, ought to be thorough. Now we shall see if such measures can be strictly applied to an Indian population.

To strengthen the hands of local authorities, the government of India, during the beginning of the year 1897, *i.e.*, after the first appearance of plague in India, passed the Epidemic

Diseases Act, which gave almost unlimited powers to local officers; the object, of course, was to try and stamp out the disease as quickly as possible.

Among the many rules framed under this Act, isolation of the sick and segregation of contacts were insisted upon. *However*, not only the people, but the plague helped the people in baffling the good intentions of Government. We know that isolation of the sick cannot be accomplished without compulsory notification. All persons under the rules were required to notify, at various centres in an infected city, every case of fever, so that the necessary enquiries might be instituted. The people, knowing that plague sometimes killed suddenly, did not report the cases till they were actually moribund or dead. Here you will note that the patients were not isolated, and the contacts had time to scatter like rabbits before they could be removed to the contact or segregation camps. They had taken the plague with them to infect other houses and areas.

Then as to cleanliness and disinfection:—generally the houses in the part of India where I come from are constructed of wattle and daub. In one part f the city called the Lyari Quarter, the people live in mat huts, which are built quite sessile on the damp ground. A number of houses are badly ventilated and overcrowded, so that the sun and air cannot penetrate into them. To remove these difficulties large holes were knocked in walls, and roofs were untiled or otherwise opened up; some of the insanitary houses were entirely demolished.

The habits again of the people are very dirty, the houses being full of rubbish of every description.

In Karachi general cleansing and disinfecting operations were carried out on a very large scale. The city was divided into suitable areas, which were placed in charge of responsible officers, having under them a very large staff of subordinates, cleansing and disinfecting gangs, and so on. Stores were supplied from a central station, and concentrated perchloride solution was prepared in the municipal laboratory with full instructions as to its use. The cleansing and disinfecting work was kept abreast of the plague; that is to say, the number of plague infected houses, so far as plague cases were known, never got the upper hand of the plague officers.

Yet, as I have already mentioned, many houses escaped treatment; in other cases the materials of which they were constructed did not permit of thorough disinfection. These were marked U. H. H., as they were entirely "unfit for human habitation"; and even after the most careful scraping and disinfection of every part of the infected houses, in some of the worst infected districts of Karachi, carried on under the supervision of some of the best European medical officers, plague recrudesced in many of them. The houses that were operated upon could be counted by hundreds. The reappearance of plague in carefully disinfected houses made many sceptical of the value of disinfection. However, there may be other reasons for the reappearance of plague in them, such as the fresh importation of infected material through the medium of a plague-stricken rat or otherwise.

This brings me to the subject of the dissemination of the disease through the lower animals. We know the susceptibility of the rat to plague, and how difficult it is to exterminate this rodent. Once I attempted to isolate a very large tenement house, from which the first case of the second outbreak of plague was reported, by surrounding it with a deep ditch, with very steep banks half filled with water supplied from an adjoining main. The object of this was to intercept all rats; a few, of course, were found in the ditch, and although we had managed to get hold of all the people in the tenements (some eighty persons), plague cases were reported from other districts at some distance from the originally infected place within a couple of days after.

No help in destroying this pest in houses could be expected from the people, especially the Hindus, who do not kill any animal, not even the ant, which he feeds with sugar. If he is much troubled he will perhaps trap his quarry to release it in the neighbouring street, forgetting that the rat will invariably return to its original haunt.

I have seen rats dead and dying from plague in hundreds in the streets and houses of Karachi during a raging epidemic. Dead and dying rats were found inside houses after thorough disinfection. If one or more infected rats are found in an inhabited house, unless the people immediately vacate, some person in all probability will be attacked.

One curious point about the rat might here be mentioned. The animal is very cute and scents danger. It is said to quit a sinking ship. I know of rats having migrated in numbers from a plague-infected district for healthy areas, which of course they infect on their way, as they drop their sick along the line of march. In the most healthy district of Karachi, called the Civil lines, occupied by Europeans, where rats were normally seldom found inside bungalows, numbers were noticed during an epidemic, and especially towards its end. One can then say that rats are confirmed believers in the evacuation of an infected district. Among other animals the squirrel and the monkey are said to be susceptible to plague. Whether fleas, flies, ants, and such like vermin play any part in the propagation of the disease is not clearly proved.

You now know how difficult it is to fight plague in an Indian city. Isolation of the sick and segregation of the contacts do not help; the latter certainly tends to spread the disease. Disinfection cannot be the sole mainstay.

The only measure to which the people took kindly in course of time in Karachi was evacuation of infected districts, and they had to be educated up to this. During the first outbreak, plague was particularly bad at one time among one sect of Hindus called the Nasarpuris, who were dying in great numbers. After considerable persuasion about two thousand of them were induced to go to a specially-prepared camp on a healthy site; here every facility was given them, including water and light. No expense was spared in making the people comfortable in their new homes. In administering plague measures in India it is absolutely necessary to take the headmen of the several castes into confidence. This can be only effected through the medium of government agency, the people being in close touch especially with the revenue officers of government. The road was thus paved for the formation of various other camps, styled "health" camps as distinguished from "contact" or "segregation" camps. I must not forget to mention that plague, after the evacuation of the Nasurpuris from the native town, soon disappeared from among them.

The people having been thus educated, formed in successive epidemics their own camps, styled in Karachi "voluntary" camps, and during the height of an epidemic it was not unusual to find something like twenty-five thousand—and sometimes more—people in the several camps. Each sect generally had its own range of huts. The camps were supervised by responsible officers. Karachi affords special facilities in possessing extensive open spaces around the city. The camps are always ready for the people to go into them on plague becoming epidemic in the town.

There are, however, a few flaws in the system which must remain unremedied. Firstly, the people cannot be prevented from taking their sick with them. They doubtless attempt to isolate them in separate huts, but communication between the huts occupied by the sick and the camps is very free.

Secondly, when large bodies of the people are turned out, disinfection of their clothing and other belongings becomes an impossibility. The people, however, have learnt to destroy by fire whatever they think has become infected. In this they are helped often against their will by the authorities, compensation being paid for articles destroyed. The sun and air does the rest of the disinfection in these open encampments. Even with these defects the number of attacks has steadily declined with each successive epidemic. I am sorry I have not the figures with me. The people return to their homes in from nine to twelve weeks, by which time the disease has vanished from their houses.

The advantages of evacuation have been understood from very early times; even the villagers of Gurhwal and Kumaon near the Thibetan frontier where plague is more or less endemic turn out of their huts and encamp at some distance so soon as plague assumes epidemic proportions amongst them. In cities like Bombay and Calcutta there may not be the same facilities that Karachi affords. In Bombay much has been done in this direction, and the people generally move towards the suburbs with each fresh visitation.

One point in fighting plague in India that has not to be forgotten is the enormous expenditure incurred by government and local authorities. Many municipalities have been practically ruined, and many sanitary and other reforms which the plague has particularly brought into prominence must wait till local bodies better their financial position.

Again, trade becomes paralysed. The influence on trade was particularly well marked in the earlier days of the plague when the measures were very stringent and the people fled from their homes. Now these have been considerably relaxed to suit the requirements of the people and things present a better outlook. The new rules framed by the present government do not appear to be so repugnant to the people.

Such then are some of the difficulties which cannot be overcome amongst a people tied down to time-honoured beliefs, prejudices, and traditions. Even if the people took to the reforms they could only stem the tide of an epidemic; something more is needed to prevent repeated appearances of plague, such as measures involving the wholesale destruction of such animals as rats, and the general protection· of the population by a prophylactic serum like Haffkine's—measures which I am sorry to say are impracticable at any rate for the present.

[*This discussion applies to the papers by* DR. FRANK TIDSWELL *and* DR. S. M. KAKA.]

MR. SHIRLEY MURPHY, the Chairman, said he had pleasure in asking the meeting to accord a cordial vote of thanks to Dr. Tidswell and Dr. Kaka for their interesting papers—papers which were of the greatest importance to them at the present time. We did not know what was before us in England or in London as to plague. Of course we did not anticipate for a moment anything so terrible as what had happened in Karachi, but inasmuch as Glasgow had had the plague to deal with, other parts of this country might have to do the same. They might have to develop an administration to look after it—in fact, the London County Council had already developed an administration to inquire into such cases should they occur. Few persons in London could claim to have had experience of the disease, but all could learn what had happened in India and Australia and other places where the plague had assumed prevalency, and it was very valuable to them to have the information derived from those sources, focussed in such excellent papers. He looked upon the papers as of very considerable value and worthy of detailed study.

Dr. Franklin Parsons (London), in opening the discussion, said the papers to which they had listened had been exceedingly valuable from an administrative point of view, because in dealing with such a disease as the plague they had to consider not only what modern science pointed out as practicable to counteract it, but also what measures popular feeling would accept. It was therefore of very great use to know how plague was looked upon from the point of view of the populace in countries where it had actually occurred, both in India among an alien people, and in Australia among people of like modes of looking at things as ourselves. They had to make people familiar with the mode in which the disease was propagated, with a view to obtain their co-operation. He had heard how when cholera first came into this country it was received with panic, and the doctors were accused of poisoning the patients; but in 1893 when it obtained some foothold in Grimsby there was no panic, because the means of prevention were known and were readily accepted by the people, with the result that the disease was soon stamped out. From the admirable way in which the Glasgow authorities succeeded in stamping out the plague, he should think that the population of this country was sufficiently educated to accept any measures which might be necessary to counteract the disease should it ever make its appearance. It seemed to him that the great danger lay in the fact that so few people had seen the plague. Probably few of those present, except the two gentlemen who had read papers, had ever seen a case of plague. That was the danger, for experience had shown that when a comparitively unfamiliar disease—such as typhus or small-pox—got ahead, it had always happened because the first case had not been recognised. He noticed that both the readers of papers had laid stress upon the rats as a means of propagating plague, but he believed that the Glasgow authorities could not find any evidence to connect rats with the outbreak that occurred there.

Dr. R. T. Hewlett (London) said it had fallen to his lot to see one of the six or eight English cases of plague which had occurred, and he also had had the opportunity of examining bacteriologically three of the

English cases. Many writers had called attention to the important part which rats played in the propagation of the disease, but he thought Dr. Tidswell's observations on that point were more striking than anything he had ever read. He took it that Dr. Tidswell regarded plague as having been introduced into Sydney by the rats. With regard to rat-fleas, it had of course been suggested that they conveyed the disease to man, but some observers denied that the rat-fleas would bite the human beings. He (Dr. Hewlett) was very interested to hear the amount of inoculation work which was carried out in Sydney, and possibly Dr. Tidswell might be able to give them some idea of the value of those inoculations. He would also be glad to know if the anti-plague serum was used, and if so with what result. He had recently had occasion to inquire into the value of anti-plague serum, and for that purpose had been to the Pasteur Institutes at Paris and at Lille, and at both those institutions the opinion was that there was a great future for the serum. There was one peculiar feature about the plague, and that was the manner in which it rose and disappeared. The history of plague had always shown that apparently the disease had existed in certain localities endemically, and then for some reason or other it began to spread, until at last it was an almost pandemic disease. It appeared in different localities, and without any apparent reason it disappeared, and then the world became again entirely free from plague.

THE CHAIRMAN said he wished it to be distinctly understood that in recent years there had never been plague in London. It had been in the Port of London, but the Port of London extended to the mouth of the river. They had not had a single case of plague in the administrative county of London, although there had been four or five suspicious cases.

Dr. F. TIDSWELL (Sydney), in replying to the observations, said that with respect to the part played by fleas, the work at Sydney had been conducted in view of Simond's researches on that subject. The inoculation of Haffkine's prophylactic had been deliberately restricted to persons exposed in the infected area, with a view to securing its aid in restraining the epidemic. Whether or not it had absolutely protected any individual could not be stated. The half-dozen inoculated persons who subsequently acquired plague had all been mild cases and had all recovered, whereas in the ordinary cases the fatality had been about 33°/₀ or 34°/₀. It would thus appear that the prophylactic had been of considerable efficacy in minimising the severity of the disease. The Pasteur Institute serum had been used in the treatment of patients. It had not been attended with such markedly beneficial results as were observed with regard to the curative serum for diphtheria. He would not like to pronounce more definitely upon its efficacy, as the cases treated were comparatively few, and perhaps no rigid inference should be drawn from them.

Dr. S. M. Kaka, referring to the anti-plague serum, said it was used in Karachi, but he could not say that the results obtained were any better than from the ordinary treatment in hospitals. Experiments were still going on at Bombay, but he was afraid, even if the serum was shown to produce beneficial results, it was beyond the reach of the poor on account of its prohibitive cost.

A vote of thanks to Mr. Shirley Murphy for presiding concluded the proceedings.

LECTURES TO SANITARY OFFICERS.

SIGNS OF HEALTH AND DISEASE IN ANIMALS DESTINED FOR FOOD, WHEN ALIVE OR AFTER SLAUGHTER; TUBERCULIN & OTHER TESTS.

BY W. HUNTING, F.R.C.V.S.

(MEMBER).

Delivered November 14th, 1900.

THE Lecturer said that in order to obtain a clear idea of the state of health of animals it was necessary to exercise keen powers of observation, and to have been associated with them. The state of the animal's body could be judged by noting the general habits, studying their ways, and looking carefully to those little signs which indicated health or the opposite. To do this successfully and accurately required practice, and he thought it was advisable therefore to detail some of those signals which the inexperienced might overlook. By this a guide would be afforded to those who desired to obtain more knowledge of animal life. Taking first of all the general appearance of animals, say a flock or herd in a field. When all were employed in the same manner, there would not be very much wrong. If they were all lying down, or all standing up, or all eating, the sign was a good one. If, however, one or two could be seen away from the others in a corner, or under a hedge, that was a sign there was something wrong. The animal would be either ill or injured.

In the market-place there were other things to be noticed. Those animals which were healthy and well would be alert, heads np, movement brisk, all denoting health, whereas others would hang their heads and have a dejected appearance, indicative of disease. Important also was the behaviour of animals, if they fed readily and answered to signs and shouts, facts which denoted the possession of all their faculties. Then the position of an animal standing up or lying down indicated something;

for instance, there were certain ways in which an animal naturally lies down, and other ways suggestive of some restraint, or in which he was trying to assume a position that afforded more ease on account of some pain or disease. If a number of oxen are lying down and you disturb them, the one who gets up, stretches himself, bends his back, and twists his tail, is all right. An animal lying quietly ruminating—a process apparently affording pleasure—indicates health, whereas the absence of that sign might suggest the opposite. Lameness, too, and inability or unwillingness to move are signs of departure from health, and they vary in degree and kind from what is caused by a slight bruise to what is due to acute rheumatism or even paralysis. One would be a little suspicious at the inability of an animal to respond readily to a stick or the human voice in its more cheerful moods. It would lead us to think there was something wrong, and other little things might then be looked for. Some of these common and definite signs may now be mentioned. Rubbing against a post or a gate: this would denote some itchiness of the skin. The Duke of Argyll, a humane man, is said to have erected posts especially for the benefit of the Scotch cattle, and they enjoyed themselves very much. When the Americans first ran the Pacific Railway across the prairie there was a good deal of trouble with the buffaloes, who thought the telegraph posts were erected for their benefit. To protect them spikes were put in the posts, but this made matters worse, the buffaloes had never had such a treat, and soon there were no poles or telegraph posts left standing. If a sheep were seen scratching or rubbing that would be very indicative of something wrong with the skin. Scab might very likely exist—a disease analogous to "itch" in the human subject. This disease was extremely contagious, and was provided for in the Diseases of Animals Act. Again, animals might be seen slavering at the mouth and stamping their feet, which were signs of a disease over which there had recently been a good deal of excitement, although not much injury, namely the Foot and Mouth Disease. Shivering, too, was a sign of disease, but shivering could not always be taken to indicate a chill or a cold. It was more a sign of feverishness as in the human subject,—what is known in the human subject as rigors. In nearly every case where an animal was shivering, if the temperature was taken, it would be found elevated some degrees. Then, too, in judging of the appearance of animals, attention should be directed to their leanness or fatness. Pigs at Christmas time were in a state of excessive fat, known as obesity, but leanness is a comparative term. In saying that an animal was lean, or speaking of lean meat, it is advisable to remember that in this country much fatter meat is consumed than in any other country in the world. On the Continent such fat meat as we have in England is never seen. The lecturer related how he once brought a number of carcases of sheep from Portugal to Southampton. These were sent up in advance to Smithfield, and when asked for next day the meat inspector, in answer to enquiries, said "Oh, that mutton, we condemned it all, we do not let that stuff through in England." He was asked what was the disease, and the inspector replied "Oh, we do not trouble about any disease, but such lean stuff as that could not be healthy." That meat was perfectly healthy, and they learned the lesson that leanness was a comparative term, and that the definition of it turned largely upon one's training. A very lean animal did, of course, suggest disease, and if the flesh and organs presented other appearances, then the leanness would be a mark of disease. Probably the reason why the continent rejected fat meat was that they there use very few joints in their ordinary cookery, whereas we have mostly joints. Without knowing much of cookery, he thought very fat meat would not be particularly useful in the making of stews and those sorts of dishes, whereas on a joint for roasting, fat is absolutely essential.

Passing from these general signs of health or disease, certain special symptoms must be understood, but a closer examination was required. The skin is extremely indicative of health, or otherwise, in animals. The hair should look bright and glossy, and lie down flat; the opposite of those conditions would suggest something wrong, as when the animal's coat "stares," *i.e.*, when the hair stands more erect than it should do. Again, when the skin was felt it should be possible to raise a handful from the subcutaneous tissues. This could be done in almost any part of the healthy body, but if the skin was what was called hidebound, this could not be done. Various eruptions of the skin would denote disease. An ox might have ringworm, a parasitic affection producing immense patches from which the hair is lost, sometimes over a surface as big as a dinner plate. Then "warbles" may be found on the skin, which are lumps, mostly to be found on the back. A little hole would be found in the centre of them, and inside was a grub or larvæ. In the pig there were seen marked changes in the skin as the result of dietetic disturbance, but still more as the result of some specific disease. There would be red eruptions, and, as a rule, these discolorations would be found on the thinner part of the skin, on the flank, the back of the ears, and the neck. Very often in animals there were the results of bruises, which showed upon the skin in the form of discoloration, sometimes accompanied by abrasions. Anything seriously wrong with an animal very soon affects some of the physiological conditions of the body. Respiration is a function which very soon gives indications of disease. An animal breathing excessively, or very rapidly—commonly spoken of as "blowing"—had a symptom which could be interpreted differently; it might be the result of over driving, or it might arise from chills and fevers, specific or simple. Excessive breathing might be commonly noticed in pigs in summer, and in sheep, but this was not an indication of disease, because it was more often the result of heat, or excitement, or exertion, being only of a temporary nature.

As a sign of disease of the respiratory organs, coughs should be noticed. A cough might be only a symptom of some irritation of the throat, an animal getting dry food or dust at the back of its throat—a simple matter; but, on the other hand, a cough might be a symptom of very grave disease. Coughs varied according to the disease, and the character of a cough is indicative, to some extent, of its cause. For instance, a cough caused by irritation of the larynx is a very free cough, anybody would recognise it as an attempt on the part of the animal to get rid of something. Unfortunately, just as strong a cough might exist in the case of an animal suffering from tuberculosis, and, in fact, it might be that tuberculosis was affecting the throat. If a cow was noticed to be thinner than usual, and had a cough which came on and was repeated four or five times, a loud free cough, as if she was trying to get something up from her throat, in nearly every case an inspector would be right in suspecting she was suffering from tuberculosis. In the acute chest affections the cough is not loud like that, because it hurts the animal. In pleurisy, for instance, the cough might be described as painful and short; the animal starts to cough but the pain checks and stops it. Then there was "grunting," another sign in animals, arising from discomfort or pain. It was not easy for a novice to distinguish between the grunt due to a stomach affection and that due to a chest affection. A cow suffering from impaction of the third stomach would grunt with every expiration, nearly as markedly as if suffering from pleuro pneumonia. The grunt of a pig is natural, and is not indicative of pain; on the contrary, when a pig ceased to grunt, suspicion would be aroused that there was something wrong.

In animals, as in man, the state of the pulse marked constitutional disturbance very truly. It would not be good to go into all the fine distinctions of morbid pulses—that wanted a fine training, and sometimes a little imagination. However, there was no doubt about the fact that a pulse is increased in the frequency of beats under certain circumstances, and therefore it is just as well to know what the normal number is. Now the normal number per minute of a pulse varied a little as to whether animals are tied up or running loose, were excited or not, were fidgetting or standing quiet, but in ordinary cases the pulse ran about 40 a minute in the case of oxen, in horses a little slower; in dogs or sheep 60 or 70, and if they were found to be 80 or 90 an observer would not say much about it unless he was perfectly certain the animals had not been subject to any recent excitement. In the pig and sheep, and nervous animals like them, he thought that neither pulse nor respiration could afford much guide, especially if these animals had to be caught before the examination was made. After the struggle to catch a pig the pulse might be anything, and the respiration the same.

How to take the pulse in animals. The pulse could be taken just at the back of the fetlock joint, or it could be taken on the outside of the edge of the jaw of the ox, inside the edge of the jaw of a horse, and in smaller animals perhaps the best place to take it is the femoral artery—the artery inside the thigh. In a dog if the fingers were put just between his thighs, so that the tips come on to the centre inside the leg, there would be found a little groove with the femoral artery very distinct, almost superficial, and there the pulse could be easily taken. A pulse could be taken also very well in a cow's tail.

The appetite of animals is of course a very important sign of disease or ill health. As a rule it takes a good deal to put an animal off its food, with the exception of febrile diseases. They will stand a great deal of pain and show very little disturbance so far as feeding is concerned. No worse symptom is ever seen by the owner of stock than marked and continued loss of appetite. If he (the lecturer) had to attend a patient whose appetite was completely gone, though every other symptom seemed favourable, he would think that the animal was on its way to the slaughterers. On the other hand, no matter how unfavourable a number of symptoms might seem, if the animal still ate it was most likely to recover. An army veterinary surgeon told him that he saw a horse, through whose jaws a 4-lb. roundshot had passed, removing eight molar teeth in its passage, put its head down and try to eat grass. He (the lecturer) had seen a horse with a fractured thigh, and six inches of the bone sticking through the skin, feeding away as if nothing was the matter, so that they could lay down as a good rule that when an animal would not eat there was something seriously wrong.

As a rule animals did not cry, tears secreted in excessive quantities passed down the duct into the nose, and escaped from the nostril. But there are conditions, not the results of local injuries, which cause an increased flow of tears. A flow of tears down the face was a prominent symptom of the most fatal bovine plague—the Rinderpest. The discharge from the nose of an animal, as a rule, is a watery, thin mucus, but this might become altered in various ways until it was thick, purulent, or bloodstained, all of which suggested disease. If there was a discharge from one nostril only, an observer would arrive at the conclusion that most probably it was due to local mischief in the nose or face; if there was a discharge from both nostrils, then he would surmise that, if it was not a cold affecting both sides of the head, there was some general disease, it might be tuberculosis, for instance. The cough would result in mucus, and generally some half-masticated food, being expelled violently from both nostrils. If there was an injury to one nostril only, the discharge would be confined to that side. Then there were swellings of the head, of the limbs or body. As a result of injury there might be swelling, and in certain diseases there were various swellings. Horses' heads swelled from influenza very nearly double the size they ought to be, and the ox suffers from a form of nettle-rash from which, in a few hours, the head and ears are half as big again as they ought to be.

A friend of the lecturer, a veterinary surgeon, who had a large cattle practice, said that in cases of this kind it was most important for the surgeon to attend immediately he is sent for, not because there is any likelihood of a fatal result to the animal, but because the animal might almost as suddenly recover, and the credit of a clever cure would be lost. It is very curious how these swellings arise in animals suddenly and then disappear almost as rapidly. A horse could be seen covered with lumps, the size of one's fist, and in twelve or twenty-four hours there would not be one of them left. The same thing applied to the cow's head in nettle-rash. The limbs of animals often showed swelling, and this might be the result of acute disease, or of chronic affections accompanied by anæmia. They did not merely get big ankles, but the swellings extended up to the knees and hocks. In these dropsical conditions the swellings could be differentiated from inflammatory swellings by the fact that they pit on pressure by the thumb. Then there were swellings of the body, some acute, some otherwise—distensions of the abdomen—sometimes the result of gross feeding, when animals had been eating too much grass, especially if the grass was coarse and non-nitrogenous. Dropsy in animals sometimes distended the animal very distinctly, but a dropsical swelling is a bi-symmetrical one, and is as marked on one side as it is on the other.

Now all these symptoms are useful if we can detect them and more so if we are able to interpret their significance. They very seldom occur all at one time, but they arise in groups, and to draw correct inferences it was necessary to know what each symptom meant, and how the absence or presence of some modified the significance of another. This would be entering into the practice of medicine.

There was one thing that must be always mentioned in discussing the question of whether an animal was healthy or diseased, and that is the temperature. Now the temperature of the external part of the body may vary a little. Naturally in cold weather one may expect to find the extremities of animals colder than the body, and this was so. But so long as all four legs are about the same temperature it did not matter what their exact temperature was. When they found one leg hot and another cold, when they found the ears and horns cold, and the other parts hot, then they would suspect the animal was not well. Irregularity of temperature was due to irregularities of blood circulation. The internal temperature does not vary like that of the external temperature, but remains the same so long as the animal is in health, at any rate, it remains the same within a degree or two, as shown by a clinical thermometer. The necessary observations were made by inserting the thermometer into the rectum, and the majority of thermometers were required to lie there for two or three minutes. The natural temperature of a horse would be 100 degrees or 100·5; that of the ox a degree higher. All thermometers were marked with a little arrow which was the human temperature, and they must not take the arrow to denote the normal temperature of a horse or any other animal except man.

Although there was a range of a degree, or even more, compatible with health, we should be anxious if there was a rise of two degrees. When there was a temperature of 102 it was a little suspicious, but anything over that pointed to constitutional disturbance, in fact, indicated that some degree of fever was present.

In the diagnosis of certain specific diseases one or two agents had recently been discovered by bacteriologists which were very useful in affording information as to the state of the animal. The information they gave was more or less in the nature of a rise in the temperature. Koch, the German bacteriologist, discovered tuberculin, or an extract from the tubercle bacillus. Tuberculin was made in this way:—Tubercular matter was collected as pure as it could be, and was treated in such a way that the specific bacillus could be separated from all others which might be present. Having obtained a pure culture of the bacillus it was placed in a suitable medium in which it could grow, and kept at the temperature at which it would multiply rapidly for some considerable time—for some weeks. The result of the temperature and the nutritive material was that there was an enormous increase of the bacillus, and changes took place in the fluid medium, due to the action of the organism. They had then an extremely poisonous and virulent material. This was heated sufficiently to destroy all the living bacilli, but even dead bacilli were nasty things to have in one's system, so they had to be got rid of, and this was done by a filter. The whole of the material, with the addition of some sterilised water, was passed through a porcelain Chamberland Filter. What went through the filter was tuberculin. It was standardised by dilution, and might be called, as he had stated, an extract of the tuberculosis bacillus.

As to the method of using tuberculin he must first point out that the process was a delicate and difficult one, if any reliable results were to be obtained. The procedure seemed simple, but is was liable to many complications and errors. To use tuberculin for the purpose of diagnosis required an injection of a dose under the skin, if there was no effect then the animal would be pronounced free from tuberculosis, but if an animal so injected was suffering from tuberculosis the effect from eight to eighteen or twenty hours would be a rise of temperature. The rise of temperature might be two, four, or five degrees higher than normal. The thermometer frequently registered 106 in cattle. If it only went to 103 it might be a little doubtful, but if it went to 104 they could safely say the animal suffered from tuberculosis. He would not advise any of those present to undertake the detection of tuberculosis by the use of tuberculin, for there were many difficulties.

There were various ordinary physiological conditions of an animal, especially in cows, which would cause a rise of temperature temporarily. They might happen to inject an animal with tuberculin just at the time the rise of temperature took place, and they might be very much mistaken consequently in their diagnosis, because it was possible the temperature of three or four degrees higher than normal would have nothing at all to do with the tuberculin. Then again, they would have to be careful to take the animal's temperature before injecting it, as the temperature of a tuberculous animal varies very much. All these points had to be considered, and even if they had a list of them it would be possible to overlook some.

Then again, the ingenious owner might deceive them. If he injected an animal with tuberculin once a week for three or four weeks, that would produce a state of the system which would not give any indication of tuberculosis as the result of an injection. Immunity could be established against the reaction whilst the disease remained. Then again, it was not a difficult matter to spoil an experiment if it was only known when an operator was coming to make his observations. For instance, if they gave a cow a couple of pails of water a quarter of an hour before the observation was made, that would take her temperature down two degrees; or if she were turned out on a wet day that would have the same result; but this latter plan would be more evident than the application of cold water internally. A quarter of an hour out in the rain would take an animal's temperature down two degrees, and the operator, instead of finding a temperature of 105°, which would be indicative of disease, would find a temperature of 103, which could not be accepted as evidence of disease.

There was another agent which they would perhaps be interested to know something about, and that was Mallein. This only concerned horses, and was used for the detection of a disease called glanders. Mallein bore the same relation to glanders as tuberculin did to tuberculosis. Mallein was an extract from glanders, and its action was very similar to tuberculin. A horse might be to all appearance free from glanders, yet if injected with mallein show a reaction indicating he was suffering from glanders. There was one curious fact both in relation to mallein and tuberculin, viz., that they both caused just as violent a reaction, just as sudden and high a rise of temperature in an animal suffering from a couple of nodules in one organ, as if the animal were saturated with the disease. In a case of generalised tuberculosis they might inject tuberculin and have no reaction whatever. In the case of a horse visibly suffering from glanders, and with a temperature of 104°, an injection of mallein usually reduced the temperature instead of raising it. One point of difference there was in the reactions of mallein and tuberculin. Mallein affected the temperature, and also caused a local swelling at the place of injection. Tuberculin caused no local swelling, and was therefore attended by only one reacting sign. Now, although these injections would shew the existence of disease they gave no guide as to the amount of disease present in any animal.

Turning to the second part of his subject, the lecturer referred to the appearances of animals after death that were indicative of disease or health. The healthy organs of the body had certain definite characteristics—thickness, form, density, colour—things which a man must see to be able to understand and remember. One operation of slaughter consisted in bleeding, and the effect of bleeding altered the appearance after death considerably. If an animal was destroyed by poison or a blow on the head and did not bleed, and was left for an hour, the internal organs would present a different appearance from what they did when the animal was bled to death. All the larger vessels would contain blood, and the organs would retain more blood in their capillaries, the result being that everything was much darker and more bloodstained in the animal not bled to death.

It was important to bear in mind that after death a rigidity set in which the physiologists called *rigor mortis*, and the butcher called "setting." Now all carcases for food ought to set well; if they did not there was probably some disease in the animal which prevented it. This rigidity, or hardening, or setting continued until putrefaction set in. Putrefaction very soon produced a change of the tissues which did away with rigidity.

An amusing case occurred a little while ago in which an officer gave evidence to the effect that the meat was flabby, but he was a little previous because he had inspected it before the animal had had time "to set." It was just as well to know that it did not set for an hour or two; that officer ought to have known better. All animals after death have a peculiar odour of their own, by the nose one could recognise duck from rabbit, or horse from cow, but it required specially trained olfactory nerves. At the same time there was a distinct odour about the sheep or ox that the practical mind would recognise as distinctive and healthy. That odour is detected immediately after death, most remarkably, just when the animal is cut open. The odour varied a little at times owing to the food the animal had eaten. Some grass caused an agreeable flavour, and some foods rendered it unpleasant. Drugs and other things would change the odour of an animal, ether, turpentine and assafœtida producing a most disagreeable change and rendering a carcase quite unfit for consumption.

In judging of the appearance of a carcase after death, one of the first things to be noticed was the fat; there ought to be a certain amount of fat, a definite quantity which ought to be properly distributed. Fat varied in animals; for instance, they knew suet in the sheep would be harder than suet in the ox, and if they saw fat from the horse it would not be hard at all, but very greasy and easily broken down. Then the colour of the organs and the colour of the carcase was an important matter, but was not definite. The first appearance of colour in the carcase was given by the fat, some animals having only a yellow fat, and some only white fat, and it was very curious to see the differences in carcases hung up together—one with white fat and another with yellow, and yet both good sound carcases. So long as the whole of the carcase was the same colour it would be looked upon as natural, but when there was a variation of colour that variation would possibly indicate disease. Bruises produced marked changes, dark red spots and splashes, and there were some diseases which produced dark red staining as a prominent sign—for instance, anthrax. Meat of this kind ought to be very carefully examined as it was serious; but there was another disease not nearly so dangerous as anthrax which made a more noticeable alteration of the tissues, namely blackquarter. As a rule only one quarter would be affected, it might be along the back, or on one of the fore or hind quarters, and there the whole of the tissues would be darkened, even to blackness, and showing decomposition before the death of the animal. Then in suffocated animals there was a distinct change in the colour of the flesh all over the animal. It was of a lighter colour than usual, being parboiled in appearance. In animals that had suffered from fever for a time there would be a darkening of the flesh and congestion of some of the internal organs. The flesh in febrile diseases was not uncommonly described as iridescent, the changes of colour being something like what takes place when tar is spilled upon water. This iridescence was a difficult thing to define and was better imagined.

The density of organs was not easily described, but practical men would notice at once alterations of normal density. The flesh ought to have a firm feel when it was set, and it ought to be elastic when pressed. When pressed with the finger it should rebound and show no mark, whereas in various diseased conditions the finger pressure left a pit, a sign that something was wrong. Flesh should be firm and not flaccid. Flaccidity of the flesh might be due to febrile disease or other causes. Some flesh could be described as soft, and some would be well described as soapy—changes indicative of disease. The density of the various internal organs was altered in disease. There might be a thickening of the intestines, lungs and liver, and other parts. There was very seldom anything wrong with the kidneys of animals, because they did not live long enough to get kidney disease. Livers should feel firm and smooth, and of the same density all through. Sometimes there would be portions of the liver harder than the other part, or there might be a uniform alteration of the density. Now there was a hardening of the liver, and there was a fatty enlargement of the liver, and one could be recognised from the other by putting the fingers on the cut surface, and feeling the greasy nature. Whether such liver would be injurious as food or not he did not know, but it might be described as unmarketable.

The size of organs differed, of course, according to the size of animals. Size was sometimes increased by disease. A bullock's heart might be hypertrophied. It did not matter so far as food was concerned whether an organ was hypertrophied or not so long as it was uniform; the mere hypertrophying of an organ did not make it any the worse for food.

The texture of flesh varied slightly; it varied in old and young animals; very young veal is very easily broken up, but the flesh of an old bull takes a good deal of separating. The bull, the heifer and the cow produced flesh which varied considerably. In examining the internal organs of a dead animal, by way of finding out whether it were healthy or diseased, it was right to bear in mind that all these organs were attached to the body or to the other organs by firm fibrous bands. So long as they were only attached by these bands that would be normal. Sometimes they were found attached over very large surfaces either to neighbouring organs or to the lining membrane of the cavity in which they were found. For instance, stomach and intestines should be tolerably easily removed if the mesentery was divided which connects them to the under surface of the spine; but occasionally they would find that these organs could not be moved without an effort — they were adherent to each other, and adherent to the cavity in which they were found. Now that adhesion of the organs to each other, or to other parts, is certainly the result of disease. The organs in the abdomen were glued to each other by peritonitis; those in the chest by pleuritic disease. The Jewish butcher, before the animal is opened, cuts a hole just behind the sternum, through which he can introduce his hand and arm and pass it backwards and forwards. If he found adhesions he would go no further. The very fact that he had found an adhesion of the lungs or liver and diaphragm would be, in his opinion, sufficient to justify him casting the animal. Our people did not rest content with that, but made a further examination of the carcase when properly opened. He mentioned this just to show the value some people placed on these adhesions. A local pleurisy or peritonitis did not affect the carcase at all. If the adhesion was cut away and the organ that was adhesive was also thrown away, he knew of no reason why the flesh should be cast. An adhesion was not so much a disease as the result of a disease, and the point was to determine whether the disease causing it was merely local or was general and specific. Adhesions might be harmless, but they might be the result of cancer or tuberculosis.

Abscesses were sometimes found in animals; an abscess is a cavity containing matter or pus. One abscess would not be sufficient reason for saying a carcase was diseased, they could remove the abscess and pass the rest. If they found a number of abscesses not in one organ but in different parts of an animal, they might say it was generally diseased.

Tumours of different kinds were found in animals. Lately a good deal had been said about cancer in the cow. Cancer was an extremely uncommon thing in the lower animals, and he knew many veterinary surgeons who had been in practice for many years, who had never seen a cancer in any one of their patients. All the hard fibrous tumours were of no danger if they were cut away. Nodules, or little tumours, varied in size from that of a millet seed to a pea and upwards. Nodules marked the presence of disease, but not always disease of a bad character. They might examine a large number of sheep's lungs, and on passing their hand over the surface would feel numbers of nodules. Now those were not the nodules of tuberculosis, but were due to the presence of a parasite. He would not recommend the lungs themselves in that condition for food, but the carcase of an animal suffering that affection would be as good as if the lungs were unaffected. There were, however, nodules marking the disease of tuberculosis, which required very careful looking after. These nodules might be found studded over the lining membrane of the chest, over the diaphragm, over the lining membrane of the abdomen; they were found in the lungs, liver, spleen, and in fact in every and any organ of the body. The presence of only a few of them was not a serious matter.

The Royal Commission on Tuberculosis reported that in their opinion many good carcases of meat were sacrificed where only one organ was affected, or sometimes only two organs very slightly. Fortunately for us flesh eaters the muscle itself is very seldom affected. Nodules of tuberculosis were, when present, nearly always found in the lungs, in the liver, or in the glands. It was possible for a meat inspector to examine a carcase, even after the viscera had been removed, and be able to say whether that carcase should be passed or not, because unless some of the lymphatic glands in the carcase had been affected, it was pretty certain that the flesh itself was not affected. If either the peritoneum or the pleura had been badly affected, then they would find in the neighbouring lymphatic glands evidence of disease, the evidence being enlargement of the gland or a white spot in its centre, or it might be a yellow caseous mass, varying in size. White spots were not uncommon signs of disease in animals, and in the smaller animals they would find them; for instance, in the livers of rabbits, but they did not always represent tuberculosis there. They were more often signs of a parasitic affection. He did not advise the consumption of those livers, although he did not know that the carcase was any the worse. Fowls suffered from this sort of thing and so did pheasants.

Another morbid change is what is called a Cyst. Small tumours they looked like to the eye, when buried in tissue, but when cut open fluid escaped. As the contents of these cysts escaped with some force, the lancing had to be done with care. Cysts were of parasitic origin, and when the right species of animals were fed with such cysts tape-worm was the result. Two common positions for the bladder-worms or cysts to be found were on the brain and on the outer surface of the abdominal organs of sheep. Fortunately with the ordinary kinds the carcase was not injurious to man.

These were the chief signs of health and disease in animals; but there was such a variety of interpretations to be placed upon them that he would not recommend the students to rely too much on these notes as affording any special knowledge. It was the ability to apply the notes that would constitute their capablilty.

THE NAMES AND SITUATIONS OF THE ORGANS OF THE BODY IN ANIMALS.*

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THE Lecturer said that all the structures in the body that have a function of their own are organs. Thus the skin is an organ of protection, and the bones are organs of support. The chief chain of bones in the body, called the vertebræ or back bone, is supported by the bones of the limbs. There were flat bones, as in the skull, to protect the brain and certain organs of special sense. The ribs protected the chest, but it was not a solid protection, as between each rib was a partition filled with muscle.

As the lectures were directly in reference to the use of animals for food, it was not necessary to say very much about the bones, because there was very little disease in bone which affected the animal for food. There was, however, one disease, of which they had an admirable specimen in the Parkes Museum, called actinomycosis. As a rule it affected the head. Years ago, before the organism which caused this disease was discovered, it used to be classed with cancer, and was probably the origin of the notion that cancer is common in the lower animals, which it is not. Most of the bones of the body were separate and joined together by ligaments. With regard to the joints these would show tolerably well-marked changes if the animal had suffered from such diseases as rheumatism or pyemia. A healthy joint, or a series of healthy joints in an animal, would be almost proof that the animal was healthy—at any rate it would prove the freedom of the animal from any general constitutional disease. The french-grey color on the surface of the joints is indicative of health, and the presence of a colourless, or nearly colourless fluid in a joint, is natural; whereas if there were a discoloured joint, and the fluid within the joint discoloured, then they would regard that as evidence of it being unhealthy.

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* The lecture was illustrated with numerous diagrams and drawings, together with a number of internal organs of freshly killed animals.

Other important organs are the muscles of the body. The muscles are the red flesh. The ordinary individual had an idea that flesh was simply laid on to the bones in irregular masses, perfectly irrespective of action, but observation would show every portion of flesh has its own special function to perform. The muscles are all separate organs, are made up of fibres, and according to the direction of the fibres, so the muscular action takes place. Muscle contracts and shortens, thus moving the bones to which it is attached. Not only are there red muscles, but there are white muscles. The red muscles were the ones under the governance of the will, and are known as voluntary muscles, while the white muscular tissues found in the hollow organs of the body and in one or two other places are involuntary in their action. That is to say, their action went on perfectly independently of the will. Such muscular tissues could be found in the intestines and stomachs. One muscle, however, was an exception to the rule, and that was the heart. The heart consisted of red flesh, and a very complicated arrangement of fibres it is. The muscular tissue of the heart is, of course, required for pumping the blood through the body. That went on whether the owner liked it or not, and therefore, the heart was an involuntary red muscle. An important muscular organ was the tongue. Between the tongue of a horse and the tongue of an ox there was a considerable difference in shape, which rendered it tolerably easy to make sure which was which. The chief peculiarity of the ox's tongue was its long pointed end. The horse's tongue, on the contrary, was long but flattened out and rounded at the tip, so that it was easily distinguished from that of the ox. The gullet, or œsophagus, was a tube which conveyed the food from the back of the throat down into the stomach. The tongue conveyed the food, after mastication, into the gullet, and as this tube was made up of muscular tissue, partly voluntary and partly involuntary, food passed down it without control of the will. It was possible for an animal to reject a portion of food which had just entered the œsophagus, but it was not possible for the ordinary animal to reject it when it got a little lower down.

The bodies of animals practically consisted of two large cavities—the chest and the abdomen. These two cavities were separated by a curtain or partition, called the diaphragm, or by butchers the midriff or skirt. The diaphragm consisted of two parts, the outer or circumferential muscular portion and the central fibrous layer. The muscular portion is attached all round above to the spine, at the sides to the ribs, and beneath to the breast bone. It was not quite a perpendicular or a flat curtain. It was placed obliquely and was concave on its abdominal surface and convex on the surface facing the lungs. When its muscular part contracted, it became nearly flat, and so pushed back the abdominal organs, and drew air into the lungs. It was not only a partition between two cavities, but was the chief muscle of respiration. It is the muscle which causes hiccough by its spasmodic action, and it plays a large part in the action of coughing. Through the diaphragm one or two important structures passed. There was the gullet carrying food to the stomach. Then from the heart large blood vessels ran back through the diaphragm, and large veins from the hind legs and back part of the body also passed through the diaphragm.

The chest had walls partly bone—the ribs—but the abdomen had walls entirely muscular or fibrous. The chest contained the lungs and the heart, two very important organs of the body. The chest was lined throughout by a fine membrane called the pleura, which membrane is reflected over the lungs, so that looking into the chest of an animal when dead, they would find it lined by a clean glistening membrane. There were some diseases which altered the appearance of this membrane very much. In cases of tuberculosis the membrane, which in health would be clear and smooth, would be roughened by the growth upon it of small nodules. As a result of pleurisy, *i.e.*, an inflammation of the pleura, there might be an exudation upon the membrane, or there might be adhesions between the lungs and the pleura. On the healthy specimen before them they would see this glistening membrane on the surface of the lung. It also formed a partition vertically up and down between the two lungs, so that it divided the chest into two lateral parts, and between them would be found the other vital thoracic organ, the heart. Between these layers we also find a number of important glands, the lymphatic glands of the chest which would be referred to later on.

The lungs are bi-symmetrical, and in a state of health absolutely fill the chest. Immediately air was let in in any quantities into the chest, the lungs collapsed, and the air surrounding them formed a space between the walls of the chest and the lung itself. If the lungs exhibited were inflated they would become nearly twice the size, and when blown up their shape would be more exactly that of the inside of the chest than when in a collapsed condition. The horse's lungs presented in front two anterior lobes or additional pieces. In some lungs there was a more complicated appearance than in others. In the ox's lung, for instance, there was a larger number of lobes, three on one side and four on the other, so it could always be distinguished from that of a horse. There was another difference in the appearance which would enable them to distinguish a horse's lung from an ox's lung. As they knew, the lungs consisted of a series of air cells. These air cells were in groups, and the groups or lobules were pressed together and covered by the pleura. Now if they cut into a horse's lung they would find it fairly homogeneous throughout, and the lobules could not be separated from each other, but if they cut into a bullock's lung they would find the various lobules constituting the lung clearly defined by the intervening tissue, and if they were torn the lobules could be easily separated from each other. The colour of the lungs was a reddish pink, varying a good deal according to the amount of blood left in the animal. In the carcase of an animal not bled, the lung on the side it laid on after death would always be twice as dark as that on the other side. The lungs were soft and elastic to the touch, but sometimes they got a lung which did not feel soft and elastic. For instance, an animal that had never breathed would have solid lungs, and animals that had suffered from inflammation of the lungs often had solid patches in those organs. A portion of healthy lung ought to float in water, a portion of hardened lung, as a result of inflammatory changes, would not float in water, nor would the lung of an animal that had never breathed. Among the articles provided for food for human beings are calves that have never breathed—some of them, in fact, have never been born, although this is not so common as it used to be. If therefore, they wanted to settle the point of whether an animal had breathed, they had only to get the lung, notice if it sank in water, and they could determine the question. Morbid changes occurred in the lungs. There were parasitic diseases, tumours, cysts varying in size from that of a nut to that of an apple. Hardening of portions of the lung resulted from specific disease, and tubercular nodules were common in and on the lung. A contagious disease which used to be common, pleuro-pneumonia, marked the lungs very clearly. Not only was the part thickened and hardened, but when it was cut into it was marbled, yellowish streaks, running through a firm tissue of different degrees of colour, from pink to red or even to black.

The heart was situated in the chest between the two lungs, and was well protected by the shoulders. It was not on the left side, but it was in the centre, and it beats a little more to the left than to the right, therefore, it was felt more to the left than to the right. The heart was contained in a bag known as the pericardium. After death a little fluid would be found in this bag, it was more a sort of vapour during the animal's life, and facilitated the movement of the heart. The bag of the heart was fixed to the sternum—the breast bone—and it was further held in its place above by the attachment of large blood vessels which ran backwards and forwards and into the lungs. The most marked difference between the heart of a horse and an ox was the fat. Without any other sign they could always tell the difference between a horse's and an ox's heart, because in the ox the fat is hard and firm, whereas in the horse it is soft and greasy, On the surface of the heart of a horse there were two furrows, running down towards the point. In the ox there were three of these furrows. If they wanted further distinctions they could put their fingers into the openings of the blood vessels, and in the septum which divided the right from the left cavity, they would find a bone in the ox's heart which is tolerably diagnostic of the animal it belongs to. The ox's heart weighed from 4 to 6lbs. The horse's heart weighed from 6 to 7lbs., and ran up in the case of large horses to 9 or 10lbs. or even more. Attached to the pericardium was one very large gland, known to butchers as a sweetbread. Where the wind-pipe branches into the bronchi, one for each lung, there is a mass of glands, the bronchial glands, and underneath on the other surface of the wind-pipe there are another set of glands, the trachial glands. These were important to men who had to inspect food, so their situation should be remembered.

The abdomen, or cavity behind the diaphragm, contained all the organs concerned in digestion, and a few other organs. The stomach was in all but ruminating animals a single organ, hollow, and bent upon itself something like the shape of a haricot bean. All the abdominal organs were covered, like those in the chest, by a fine membrane, called the peritoneum. Just as the pleura lined the chest, so the peritoneum lined the abdomen, and was reflected over each of the organs in that cavity. If they cut open a stomach or intestine, they would not find a firm hard membrane, but they would find a softer membrane generally covered with mucus; that was the mucous lining of the abdominal organ. The stomach and intestines had a mucous lining, and they had a muscular coat which enabled the organ to make certain movements. Those movements were slow contractions, and were sufficient to carry the food through one digestive part to the other. In ruminants, the ox and the sheep, there was a set of stomachs unlike what was found in other animals. The food passed down the gullet into the rumen, a large bag in which not a fourth part of digestion takes place. This rumen is known as the paunch when dogs are fed on it, but as tripe when men are fed on it. It was the receptacle for the hurriedly swallowed food, and ruminants could store an enormous quantity there, enough, in fact, to fill a wheelbarrow. When the animal was thoroughly distended, it would lie down or sometimes stand quietly and enjoy the process of rumination. The rumen is tolerably well recognisable out of the body, or even a portion of it, because it had what none of the other stomachs have, large masses of white muscular tissue which form bands across the stomach, and partially divide it into two different sections, in fact, almost into four. These were muscular bands or contractile organs which enabled the ruminant to force food from the rumen back into the mouth. The rumen had a very much smaller bag attached to it called the reticulum, which was called so on account of the curious arrangement of its lining membrane. Even a small section of the stomach enabled a man to recognise what it was because the mucous membrane formed a distinct honeycomb pattern, the edge of the honeycomb standing up well above the rest of the membrane. Ruminants had a third and a fourth stomach. The third stomach is known as the omasum or many plies, its mucous membrane is artistically arranged in a series of parallel folds standing up over an inch in height, and between them was generally found a mass of hard food. From this omasum the food passed into the true digestive stomach, the stomach which digests the nitrogenous matter; this fourth stomach is called the abomasum or rennet. These first three stomachs of the ox are to be looked upon, not as true digestive stomachs, but as receptacles which prepare the food for digestion in the fourth stomach. From the abomasum, as in other animals, the food passes directly into the intestines.

The intestines consist of two kinds, the small and the large. In such animals as the dog and other carnivorous animals, the division into large and small intestines is, anatomically, more or less imaginary. These animals have an almost straight intestine, varying little in calibre. In the horse and ox the difference between large and small intestine is very apparent. The small intestines of the ox are more conspicuous for their length than anything else; they are twice as long as those in the horse, and stretch to 120 or 140ft. The pig has 72ft. altogether, 56 of which are small intestine; the cat and dog have very short intestines—digestion in the carnivora taking place nearly entirely in the stomach. Animals with large intestines have a considerable amount of intestinal digestion, chiefly, of course, of the hydro-carbons of the food.

The liver is situated just at the back of the diaphragm. The horse's liver rests on the left side, and extends on both sides of the diaphragm, with a little more on the right, but the ox's liver is almost entirely on the right side of the diaphragm, because the ruminant required more room on the left side for the large stomachs. An ox liver weighed about 8 lbs. The colour was dark brown, not varied, and its surface was smooth, firm to the feel, and homogeneous. Variations in colour would be a little suspicious, but variations of colour pointed to diseases which he did not think would do much harm to other animals consuming them as food. A discoloured liver might be described as unmarketable, and the inspector would be quite justified in preventing its sale if there were evidence of some degeneration or fatty change of the organ. Worse than these were the livers containing spots of different colours, or little tumours varying in size, the solid ones being probably tuberculous in their nature, and the hollow ones containing fluid being parasitic. The presence of one parasitic cyst in a liver would not warrant the conclusion that the liver is not healthy; the cyst could be cut out and the rest made good food. The ox had a square-shaped liver with a little separate lobe on its under surface; the horse had a liver more artistically made up of three lobes; the pig's liver had five or six lobes; the sheep's liver was the same shape as that of the ox. The difference in the number of lobes would enable them to differentiate between a pig's liver and that of a sheep.

The horse had no gall-bladder, and in that he was absolutely distinct; all solid-hoofed animals were destitute of a gall-bladder.

The spleen was an organ attached to the stomach, in the ox to the rumen. The horse's spleen was of crescent shape with two points, wider in the middle tapering off at both ends. In the ox it was square at the ends, a useful distinction. The spleen was a mottled grey colour, and was made up of a fibrous network containing a pulp; it was known to butchers as the milt. In some diseases the spleen was enormously enlarged. During digestion the spleen of all animals becomes distended. It was an organ capable of healthy distention and contraction to its normal size. It was a marked sign of anthrax in the ox when the spleen was ten times its natural size, and very easily broken down with the fingers, about as dangerous a thing as anyone could do. Before anthrax was diagnosed as an organismal disease it used to be called splenic fever, and people made these dangerous *post mortems* with innocence. Government now almost forbade such *post mortems*, and specially warned persons that they were not to be made if the operator had a scratch on his hands.

Another gland in the abdomen, the pancreas, was concerned in digestion. In the horse it was just behind the liver, lying across the spine; in the ox it was situated a little lower down in the folds of the mesentery. All the intestines were held together from the spine by folds of the mesentery.

The kidneys were found a little further back still, attached to the spine; in the ox the kidneys were extremely large and tabulated, in other words they are made up of a number of simple kidneys aggregated together. The kidney of the pig was of squarer shape at the ends. The shape of the horse's kidneys was different, one kidney being quite a heart-shaped object, but the other more the shape of a sheep's kidney, something of the form of a haricot bean.

Having described the bladder and the uterus, with their diseases, the lecturer turned to the lymphatic glands, which he said were extremely important and very interesting. A large number of these glands were sold as sweetbreads, and it was very necessary to ascertain that there was no disease about them. He described the glands in the various parts of the body, their functions, and appearance. Tuberculosis affected some of the glands more than others, such as the mesenteric, the mammary gland, the throat glands, and the bronchial; and these required careful inspection in the slaughter-house. These lymphatic glands were placed all over the body, and might be looked upon as sentinels to detect any impurities which might pass into the system. If therefore they met with suspicious signs in any internal organ, let them examine the nearest lymphatic gland, and if they found it enlarged or changed in colour, or presenting hard nodules or white spots in their centres, they would know disease was present, This was important, because if they had to examine a carcase with all the viscera removed they must cut into the lymphatic gland, and if disease had passed from the internal organs into the tissues it would have infected the glands. If not, they might conclude that that carcase was not infected generally, and was therefore fit for consumption.

PRACTICAL METHODS OF STALLING AND SLAUGHTERING ANIMALS.

By W. HUNTING, F.R.C.V.S.

(MEMBER).

Delivered November 19th, 1900.

The Lecturer, in commencing, remarked that his subject was not an artistic one, but the necessity for animal food required the slaughter of animals, and so long as people were not vegetarians, animals would have to be killed for the supply of human food. No doubt it was possible for human beings to live on vegetables, but a glance at the anatomy and physiology of the human organs showed that their internal economy was specially adapted for the use of animal food. In slaughtering, humanity required that as little suffering as possible should be inflicted, therefore the mode of death should be either preceded by insensibility, or accompanied by loss of' sensation in the very shortest time. The appearance of meat depended somewhat on the mode of slaughter, and all these circumstances had to be taken into consideration. To assist them they had the empirical knowledge which practical men had gathered, and which they had told to others as to the effect of various methods of producing death. Thus, if it was desired that the meat should keep well and the carcase should look well, a certain period without food is desirable on the part of the victim. The usual thing was to starve an animal for twenty-four hours before killing. It was not easy to explain why this should make a carcase keep better, but a similar condition obtained in operations on the abdominal organs. It was well known that operations on the abdomens of animals are more successful when animals have been starved a short time previously than when they have not. To the agriculturist and the veterinary surgeon this is illustrated most forcibly in the spaying of pigs. It was noticed that the mortality amongst pigs is greater when they had food than when they are starved. The possible cause of this appeared to him to be that when an animal is fed up to the last, and has no opportunity of exercise, the body becomes charged with unassimilated nutritive material, whereas if an animal is starved for twenty-four hours there is a consumption of all superfluous nutritive matter, and possibly a condition less favourable for the development of bacilli. Not only was it advisable therefore to starve animals for some time before killing, but as they frequently came long distances by road or in railway trains, they should have a rest—if possible of some days, but certainly of some hours. After over-driving flesh did not keep well, nor indeed after any violent exercise. Then again, as the result of being driven, animals by the fault of their drivers or by their own fault would become bruised, and this also followed carriage in the railway trucks. Those bruises did not last long, and it was as well for the bruises to disappear.

It is necessary when operations of slaughter are conducted on a large scale that there should be proper provision for keeping animals before slaughter; in fact, there should be proper lairage. Without going into any architectural matters, they could see that in a place where animals are constantly passing through and had to be detained for a little time some comfort should be given, and that provision should be made for the proper ventilation, drainage, and cleanliness of their quarters. To put a few animals that are fairly fresh into a large lair is not advisable, because they become rough and chase each other. Again, it would not be proper to turn a large number of animals into one big open place, it being far better to put them into pens. The question as to the amount of cubic space necessary in lairage was not a matter they need go into, because in these places the roof is generally a good height from the floor, and therefore ventilation is free.

Dealing with the methods of slaughter, let them first consider the method of producing insensibility. Now insensibility was not always produced for the sake of humanity, but for the safety and convenience of the men about to operate on animals. There were various ways of doing this. Shooting would occur to everyone as the quickest method of disposing of an animal, but unfortunately that had disadvantages. Men required to have a good aim, and it is said by persons engaged in the slaughtering business that the carcase of a shot animal does not keep. Horse slaughterers stated that a pole-axed horse would keep twice as long as a shot horse. Now either shooting or pole-axing required skill, and to get over this difficulty of skill many mechanical inventions had been brought out. Greener's patent is one of the most commonly used. This was a tube with a cartridge. The cartridge was placed in one end of the tube, and upon being struck with a hammer or mallet it exploded, and had the same effect as a gun. The advantage was that they did not require to take aim. The operator could walk up to the animal, place the tube against the animal's forehead, and then strike it. The work was done effectually, but there was one objection to it. Every now and then the bullet would pass through the side of the neck of the animal, and might do damage if used in the streets of London when hundreds of people stand round an injured horse, and advise the operator how to do his business. There was yet another objection to Greener's patent. A pole-axed horse would lose very little blood unless his throat was cut afterwards, but the bullet of a Greener's apparatus broke up the base of the brain, and the result was a very considerable loss of blood through the nose. Now the flow of blood in this way is objectionable in animals killed for food, because some of it would pass down the windpipe and produce a peculiar blotched appearance of the lung, rendering that organ, although not unhealthy, almost unmarketable. It was, however, better for a man to use Greener's patent than the pole-axe if he was not an expert. The pole-axe penetrates the brain, having a lengthy protuberance on it. In the horse a very long pole-axe is not required, because there was very little except a plate of bone over the brain, whereas in the ox there is a large double plate with a space between, so that the pole-axe must be longer to be effectual with the ox. As the pole-axe penetrated the brain it broke up some of the tissues, and if an animal was struck properly he was knocked down and died in a very short time. Experience showed that in a pole-axed animal if not bled the heart would cease beating in some four or five minutes. The importance of this fact was that as soon as the heart ceased beating the escape of the blood from the vessels is not so thorough as it would be if the heart continued beating. If they stunned an animal without penetrating the brain—and calves, pigs, and in some country places bullocks, were stunned with a big hammer which produced concussion of the brain—the animal might revive and get up. The heart did not always stop beating as the result of concussion of the brain without fracture of the skull, but in such a condition the animal might live, and his heart go on beating for some considerable time. You would say then, so far as bleeding went, stunning with a blunt instrument was better than a pole-axe; but there were difficulties. The ox possessed an enormous frontal region of great thickness over the brain, which, as a rule, rendered the attempt to produce insensibility by blows with a hammer a somewhat brutal performance, four or five blows having to be given before producing insensibility.

Another method of producing insensibility was pithing, which consisted in dividing the connection between the brain and the spinal cord by an incision between the head and the first bone of the neck, or between the first and second bones of the neck. Pithing was a good method of producing insensibility. In Portugal and Spain, hammers or pole-axes are not allowed to be used in the abattoirs. The same thing, he believed, held in Italy. A curious thing occurred in pithing that occurred in no other method of slaughter. It sometimes paralysed the heart, and when the animal fell, which it did instantly, some large veins at the base of the heart would give way, and the chest would receive a quantity of blood which would cause staining. Pithing required a little art, perhaps more than pole-axing. It was necessary to depress the nose of the animal, because when his nose is depressed the space between the vertebræ is opened wider than it is if the head is straight, the knife then more easily penetrates. There was the question as to whether it is advisable to use masks or blinds. In horse slaughtering nearly every horse slaughterer puts a cloth over the horse's eyes before he attempts to strike him, possibly it was more advisable with that animal than with the ox, for the horse was more alert and more apt to move his head. The use of the mask with a movable bolt in it, which was invented so as to enable men to do their work without missing the right spot, is not a very useful invention. The bolt is, of course, in the proper position, and is struck with a mallet, so that even an amateur ought not to fail. An expert with the pole-axe would do his work more quickly and quite as certainly. The mask with the bolt was an apology for bad work, and with the man who could use a pole-axe, all that was required to do the work properly was to get the animal's head in a proper position. He was inclined to think that the ordinary slaughterer with the pole-axe would do his work as effectually and thoroughly as a man could with a gun.

However, whatever method was adopted with regard to producing insensibility, the great thing in slaughtering was that the animal must be bled. If the meat was to be kept, as much blood must be removed from the carcase as possible. There were various methods of bleeding. The ox had an extremely thick skin, and the butcher generally divided that skin before he attempted to divide the arteries. Having divided the skin he inserted his knife so as to divide the large blood-vessels just as they came out of the chest. If the knife went a little too far they would have what they call "over-sticking," and a lot of blood would escape into the chest instead of coming out of the body. The result was a considerable staining of the lining membrane of the chest. The men endeavoured to get rid of the staining by getting rid of the pleura, and then the meat inspector would come round and say, "This is a case of tuberculosis, or you would not have stripped the pleura off." Movement of the limbs favoured bleeding, and therefore it was desirable not to tie an animal up too tightly when secured for slaughter. Of course, all the blood in a body could not be removed by any method—some would always be retained in the capillaries. Every movement of the limbs forced blood along the veins, and therefore the convulsive movements of a dying animal would favour removal of blood from the muscular tissues.

In considering these various methods of slaughter it might occur to some that as pole-axing soon stopped the heart and stunning weakened its action, that an animal would bleed better without either. This consideration suggested reference to the method of slaughter adopted by Jews and Mohammedans. They did not attempt to knock animals down or to produce insensibility, but they cast the animal. Now casting is not a pleasant process, because the slaughter-house was generally stone-paved, the animal was cast with ropes, and sometimes it would have a fractured pelvis as a result of casting, and always bruises. The worst part of the process in this method of slaughtering was that when the animal was on its back, and they required to stretch the muscles of its neck as far as possible, they took the nose as a lever and the horns as a fulcrum, and very forcibly stretched the neck. He thought that part of slaughtering merited the term of brutality. The object of it, of course, was to stretch all the tissues so that a stroke of the knife would be more thorough and effective than otherwise. The men who used the knife did their work remarkably well; every tissue and every structure was severed down to the spinal column, and the bleeding was free in the extreme, in fact, it was advisable not to stand within some feet of the animal.

This was a difficult subject to discuss, because slaughtering for food, both by Jews and Mohammedans, was regarded as a sacrificial rite. The question was whether there was much suffering except in the stretching of the neck in the horrible position he had described. He was inclined to think there was very little suffering after the Jewish butcher had drawn his knife across the arteries with one stroke, and that the animal then experienced little or no pain. There used to be a practice of bleeding calves, but he did not think it was much followed now. This was done in order to get the flesh white. The method was to open the jugular vein the night before slaughter, and to remove blood to an extent to render the animal faint, and then finish it off the next morning. He did not think much of this was done now, nor was it necessary or justifiable in any way.

Sheep are, in this country, what they call "stuck," and as a rule no attempt at the production of insensibility is attempted. To see a novice or an apprentice endeavouring to find the blood-vessels was by no means a pleasant sight. He doubted whether this method of sticking sheep should be practised any longer. In the Paris abattoir they are killed as the bullock by the Jewish butcher. The sheep is laid on its back, the nose is depressed, and the neck stretched, and one stroke of the knife across the throat severs every blood-vessel. Why that could not be done here he did not know. It was certainly a much more humane and rapid method of destroying the animal than that now practised in this country. To see a man trying to break a sheep's neck before it was half bled was a sight which would suggest to an officer of the R.S.P.C.A. that a man ought to have a month's hard labour. If a sheep had its throat severed at one stroke, as the calves and sheep did in Paris, everything that was requisite for slaughter would be carried out. As to calves, probably because they were larger animals than for any other reason, they were stunned, but why he did not know. In some other parts, in Hungary for instance, a calf would be hung up with his hind legs tied together, his nose being a foot off the ground, then in that position he received a blow on the poll, he was stunned, and his throat was cut. Here a somewhat similar process took place, but in Paris they were not stunned, the knife only being used. Pigs were stunned in most places, and the reason why probably was to produce insensibility and so keep him quiet. It was not the custom to pole-axe pigs, because it was desirable to keep the pig's head intact, and the stunning was therefore done with a broad, flat surface, with a big hammer, or a piece of hard wood, a round oval disc, three or four inches across. With that insensibility could be produced immediately, and the skull was left intact.

The slaughter of fowls in this country was not a nice process, and he did not see why the old farmhouse method of wringing their necks should be altered. It was effectual, and was certainly not inhuman. He did not like the process of destroying turkeys and geese, for to see a farmhouse man with a small knife making holes in the roof of the mouth, or trying to divide the carotid artery suggested unnecessary pain, and he failed to see why the head should not be decapitated at one stroke.

The effect of habit was curious; for instance, we made a great fuss if meat was not perfectly sweet, and yet a connoisseur would not eat game unless it was putrid, or, at any rate, quite high. It was said there was a great deal of difference in the gustatory qualities of a hare according to the way in which it was killed. Epicures like hares that have been coursed, but with the bullock exactly the opposite obtained, for they are allowed a little rest before being slaughtered. The hare was preferred when its death was preceded by fright and fatigue, and when every blood-vessel in its body was thoroughly distended.

Turning to the question of slaughter-houses, the lecturer said the requisites of a good slaughter-house were the machinery for lifting the carcase, floors and walls of a nature that rendered washing simple, and cleanliness with proper ventilation. All slaughter-houses are under the superintendence of the public sanitary officer, and so far as cleanliness goes he could interfere. But slaughter-houses are in such large numbers, and local authorities are so lax in their regulations, that a good number of them are hardly visited at all, and animals might be killed without any inspection. Personally he was of opinion that all meat should be inspected before being sold. This no doubt was an interference with trade, and it might be argued that so long as you dealt with a respectable butcher you are perfectly safe. Quite so, but all butchers were not respectable. Inspectors would know what kind of meat was sometimes offered for sale, and the worst of it was that a good deal of this was manufactured into the so-called "table delicacies," and what these consisted of no one knew. Now the difficulty was that until the private slaughter-house was done away with there could never be a thorough inspection of meat. The butcher, not unnaturally, objected to public abattoirs being established. In some towns the objection had been carried out so thoroughly and practically that the butchers built for themselves an abattoir outside the boundaries of the town, and then laughed at the municipal authorities because they could bring in what they liked. It was much easier abroad to establish abattoirs and to have a thorough inspection of meat than it is in this country, because nearly every town was hedged round with walls and gates, and tolls were levied called "octroi duties," that is to say in Continental towns there was a set of men ready to prevent anything being brought in without proper inspection. Here carcases were brought by rail or road, or canal, and anything they liked could be sent up. An agriculturist being an economical man did not like to waste anything, and very often a sick cow was killed in order to save it from dying. If the animal was found dead they would remove as much blood as they could by cutting its throat, and then send the carcase to market. If there were merely public abattoirs in a town it was perfectly certain that the practice of the farmer would not be stopped, as all the worst meat and diseased animals would be sent to a private slaughter-house and so disposed of. It seemed to him, however, that the public abattoir would in time be adopted, even by the butcher, because he could have his meat killed properly, and if he wanted it to set well it could be put into cold chambers—particularly was this advantageous in summer. The small butcher could not possibly have this advantage, and probably, the public would some day insist on having all their meat inspected. Probably the complaint of the butcher that he did not care to have his business interfered with by the authorities, and known to his rival in trade, was to some extent justified, but the good of the community had to be considered. It was said that by establishing abattoirs out of the rate-payers' money, the butchers' private establishments would be shut up. He thought if the butchers' private houses had to be shut up for the sake of the meat consumer, then the butcher should be paid for them. If the butcher knew that when his slaughter-houses were compulsorily closed he would be compensated, there would not be anything like the objection there is at the present time to the establishment of public abattoirs.

The Health Acts were difficult to administer, and, in fact, he had never found a man who was able to understand the conditions of all the Public Health Acts. Some day, he hoped, there would be an amended Public Health Act which would do away with all the privileges which some had and some had not in order to make a law general and uniform. Under the conditions which he had named it would be possible to secure the slaughter of animals under the very best conditions, and to have meat inspection carried out in a proper manner. In time all the large towns, at any rate, would have public abattoirs, and probably the smaller towns would follow suit. There would then have to be some provision for the man who found that what he hoped was good meat turned out to be unfit for human food, and who reported its condition instead of trying to sell it. A butcher who bought an apparently healthy animal, and found after slaughter that it was unfit for human consumption, should have redress against the farmer who sold it, or should be compensated out of the rates.

NOTES ON THE NEW RESEARCHES ON THE PROPAGATION OF MALARIA IN RELATION TO ENGINEERING AND AGRICULTURE.

By Professor ANGELO CELLI,

Director of the Hygienic Institute of the University of Rome.

(HON. FELLOW).

One of the most recent conquests of the experimental method at this century-end is the precise knowledge now possessed of how malaria propagates itself. By the same method as far back as in 1886 I demonstrated beyond question that drinking-water is not the vehicle of malaria. Nevertheless, even Manson was unable to emancipate himself from that ancient prejudice when, formulating—on the analogy of his famous researches on *Filaria Sanguinis Hominis*—the hypothesis that gnats could suck and cultivate the malarial parasites, he invoked drinking-water as the agent in the definitive propagation of that epidemic disease. Bignami, on the other hand, maintained that the theory of inoculation by gnats was more probable. Dionisi maintained the same thing for the malaria of birds, and in regard to that disease I demonstrated by experimental inoculations that the germs of it are not found in the soil.

In the meantime Patrick Manson had the distinguished merit of stimulating and directing the work of Ross. The latter was the first to prove by the test of experiment that the malaria of birds is transmitted by means of common gnats (*Culex*), and that in like manner human malaria multiplies itself in the bodies of special gnats with dappled wings, which by the work of Grassi we now know to be *Anopheles*.

Soon the Society for the Study of Malaria, and more particularly Grassi, Bastianelli, Bignami, and Dionisi, extended and perfected Ross's discovery, demonstrating in several ways that only the various species of the genus *Anopheles*, and not *Culex* nor the other sucking insects, propagate human malaria; while in the meantime, in conjunction with my pupils Casagrandi and Delpino, I occupied myself with reviewing and co-ordinating the epidemiology of malaria with its prophylaxis in accordance with recent etiological views. To all this Anglo-

Italian work Koch has added little that is essential, even when he has not fallen into imperfections of observation.*

The practical corollaries which flow from the new researches are manifold. Here, however, I wish only to indicate the points that most interest the engineer and the agriculturist.

It is therefore now beyond question that a malarial human being, that is, one who has the specific parasites in his blood, is the first source of infection. The *Anopheles* mosquito, which sucks that blood, is the other source of infection, and also the vehicle that carries the germ through the air, and the means of inoculation. It is further certain that these gnats live in humid places at various altitudes, in Italy from 0 to 1300 mètres. But for the local origin of an epidemic, besides a malarial human being and *Anopheles* mosquitos, there is required a suitable temperature (from 20° to 25° C.), that is, the opportune season, from which fact malaria in old times was also called "seasonal fever."

In order to live on the surface of the earth all gnats require water through the whole period of their aquatic existence, that is to say, in their larval and nymphal stages. As Tommasi-Crudeli had already shown, the soil may be of any nature and constitution, provided it has water on the surface; the water may also be contained in reservoirs outside the earth. Water is therefore the sole and true condition that is indispensable for the development of mosquitos, and therefore of malaria, in every place where that disease is prevalent.

In regard to the relations between soil water and malaria two theories used to hold sway, both of them designed to explain Roman malaria.

One was that of Lancisi, according to whom the great marshes and the great littoral ponds were the foci whence the baneful effluvia were carried about by the winds.

The other was that of Tommasi-Crudeli, according to whom not only the great marshes and ponds, but the thousands of small marshes scattered over the whole Campagna are all so many independent foci of malaria.

The new researches demonstrate in their turn that all waters, with a few exceptions to be noted by-and-by, may by becoming stagnant be foci of malaria, because they may be a nidus for the larvæ of the specific gnats. Hence it is of interest both to the engineer and the agriculturist to know the customs of these gnats, as Ficalbi, Grassi, myself, and Perrone have studied them in the various parts of Italy.

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* For example Koch maintains that to destroy malaria in a place it is sufficient to subject those suffering from the disease to assiduous treatment; and he does not think it impossible that *Culex* also may transmit the malaria of man as well as that [illegible] both ideas are absolutely incorrect.

Briefly summing up the results of very numerous observations it may be stated as indubitable that:—

1. *The Larvæ of Anopheles* live in any water, clean or foul, clear or turbid, acid or alkaline, and ferruginous. They do not live in water (1) containing salt (salt marshes, sea water, and mixtures of that with fresh water in the proportion of two to one); (2) very strong sulphur waters; (3) water that is putrid from the putrefaction of animals or textile plants. They avoid water (*a*) in which there is any movement (currents, ripplings caused by even light winds such as sea breezes, mechanical disturbance as by the passage of boats); (*b*) without vegetation of aquatic plants, of which they prefer the filamentous species which do not occupy the whole free surface of the water where they rise to breathe.

2. *The Aërial Anopheles* are little domestic animals which live in and around houses. It is on this account that malaria is so often a domestic epidemic, that is to say, a disease which is contracted for the most part in the interior of dwellings, or in their vicinity.* They bite in the evening and at night, and from olden times therefore these have been looked upon as the most dangerous hours for the contraction of fevers. The insects are carried to a distance, not only by the wind, which they dread because they are beaten down by it, but passively, that is to say, on man, on his belongings (grass, hay, wood, beasts), and on his means of locomotion (carts, coaches, railway carriages, etc.).

From these facts, which are now thoroughly established, are deducible several corollaries useful in practice for engineers and agriculturists.

I.—COROLLARIES FOR HYDRAULIC ENGINEERS.

In the first place certain prejudices that have for a long time held sway in the schools have been definitively removed.

For instance, it can no longer be maintained that a puddle or lake is improved by the water level being kept constant. On the contrary, if the waters are still and—as happens in the neighbourhood of the edges—there grows an aquatic vegetation, there the larvæ of the *Anopheles* gnats mostly make their nests. Such is the case, for instance, in the Mantuan lakes, which are just the ones that supplied a pretext for the prejudice as to such imaginary advantages of the water; in these wherever there is no current and there is exuberant marshy vegetation of filamentous grasses, the fever-breeding gnats multiply by myriads in spite of the constant level.

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* The *Anopheles bifurcatus*, which is wild, nevertheless comes near to houses in order to bite and suck blood.

Another prejudice, already combated by Tommasi-Crudeli and now definitively buried, is that putrid waters and the emanations therefrom are causes of malarial fevers, whereas, on the contrary, it has been seen that the specific gnats do not live in stinking waters.

Another prejudice which is already crumbling away, although the Paris Academy of Medicine not long ago attempted to revive it,* is that waters which are brackish owing to a mixture of fresh water with sea water, and salt marshes along the littoral, are very unwholesome. On the contrary, I had already, in conjunction with Casagrandi, experimentally demonstrated, and Perrone and Centanni have since confirmed, that the larvæ of *Anopheles* die in sea water, in mixtures of that with fresh water in the proportion of two to one, and *a fortiori* in water still more salt, such as saline springs. Professor Ficalbi, our greatest authority on the zoology of gnats, after many researches along the littoral of Ferrara and Ravenna, has accepted these ideas. The prejudice that salt waters favour the genesis of malaria must also therefore be cast aside.

Having thus briefly seen which are the gnat-breeding, and therefore the malaria-breeding waters, I pass on to indicate the new criteria with which engineers who have to carry out hydraulic improvements designed to free districts from malaria should be acquainted.

It is known that these improvements can be secured by means of—

a. Natural drying by large canals with a high-level water-course;
b. Mechanical drying by means of pumping engines;
c. Earth embankments;
d. Drainage.

This last method may be sufficient of itself or may be complementary to those previously mentioned.

Every hydraulic improvement whatsoever—if, as ought to be the case, it is intended to be a true and proper sanitary reclamation of an unhealthy country—has to sweep away the conditions favourable to the life of the specific gnats, and must therefore either remove fresh waters from the surface of the earth or put them in motion. The entire removal of the water from a marshy zone is not an easy thing, and indeed very often is not possible. For instance in improvements by means of canals with a natural fall, there always remains in these an amount of water more than sufficient to give life to all the gnats that may be there. And thus in the improvement of the Pontine Marshes, according to Perrone, not in the great collecting canals where the water is to some extent in motion (sea breezes, passing boats, currents, etc.), but in the secondary canals where the movement of the water is hindered by marsh vegetation, there is an abundant development of larvæ of malarial gnats. Thus too in the canals of works for mechanical exhaustion such larvæ are found not only in the neighbourhood of the pumping engines, but everywhere throughout the rest of the canals.

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* The Paris Academy of Medicine in its sitting of May 29th, 1900, approved the instructions against malaria drawn up by Blanchard, Kelsch, Laveran, Raillet, and Vallin, which are full of many musty prejudices. See "Revue d'Hygiène," &c., No. 7, 1900.

And in both methods of improvement even when in the line of the current there is a certain velocity and a free surface of water (two conditions which, as I have said before, the *Anopheles* larvæ avoid), nevertheless along the edges of the canals there is either some incurvation or some grass where they hide; and for this reason such improvements do little or nothing for the sanitation of an unhealthy region.

For these disadvantages engineers must strive to find remedies. For example, the engineer Perrone recommends that canals with a free surface should have, whenever possible, a double section, the lower one being the narrower, in order to increase the velocity in time of scarcity. Periodical flushings should be made, at least at intervals of twelve to fifteen days, to clear them of larvæ. All marshy vegetation should with assiduous care be uprooted as it springs up. It is better that the pumping plants should be numerous and small rather than that they should be used over too large a zone; and I would add that whenever possible they should be washed out periodically with sea water which is hurtful to the larvæ of the gnats.

Embankment works as long as they are incomplete, with their basins of water in process of decantation, with their canals of low velocity, always come to be a nidus for mosquito larvæ. For this reason the works should be suspended from May till October, and in these more dangerous months the tanks should be allowed to dry up, and by repeated flushings and assiduous clearing away of the grass, the canals should be kept free from the conditions favourable to the development of the hurtful insects.

On the other hand drainage is the most effectual method of improvement, as it is that which takes away from the mosquito larvæ any possibility of life, by depriving them of water and air.

It is necessary, however, to provide that the water in the collecting canals of the various drains should run out of them either constantly by itself or by periodical emptying; nor must the clearance of the edges which has already several times been insisted on, and the constant attention to the sides and bottom, ever be neglected. And where one and the same ditch or canal has to serve for the escape of the ground water and for that of storm water, the latter should be separated from the former, the subsoil water being carried away with the drains, while above these should be the bed for the storm water. In this way a great part of the Roman Campagna might easily be improved, and the success which the ancients attained there with their many and marvellous works for the removal of of ground water might be regained.

If now we wish by the application of the criteria which have been set forth above to judge of the improvements lately carried out in Italy, and estimate their hygienic importance, no one can wonder if the sanitary effect has seldom, if ever, been attained. Even in the best executed of such works the neglect of the small canals is sufficient to destroy or to impair their hygienic value, since frequently the velocity of the water, at least along the edges, is *nil*, and the most abundant and undisturbed vegetation there shelters all the hurtful larvæ.

Wherefore the improvements already made should be corrected as far as and wherever this is possible; and those that are still to be carried out, should be planned and executed in the light of the new criteria.

Lastly it is also, I believe, of interest to the hydraulic engineer to know how the keeping in order of the mouths of rivers is to be regarded from the new point of view. There the engineer Perrone has never found mosquito larvæ, not so much on account of the brackishness, which sometimes may be very slight, as of the movement which, at least at certain hours of the day, is not wanting, owing to tides or breezes. And as this alternation of motion and rest can never be wanting, he maintains that the conservancy of estuaries (dikes, moles, mouths, etc.) never tends to facilitate the development of the *Anopheles* larvæ, and thereby of malaria.

II.—COROLLARIES FOR SANITARY ENGINEERS.

The house in malarial regions may, as has been said, be the point of greatest danger from fevers, while on the other hand, if properly built and equipped, it may be the safest place. Formerly, in every malarial district, it used to be required (and as far as possible it ought still to be required) that the house should be built in the highest and dryest situation possible; but this is not sufficient, for the gnats, directly or passively, will get up to it. For example, the houses on the tops of the most beautiful hills of the Roman Campagna are greatly infested by fevers, and on the low level of the Pontine marshes the gnats go up, for the most part passively, to the dwellings standing above them to a height of more than 300 metres. It used to be said (and the advice is still useful) that the floor of the dwelling should be raised from the ground, and that it should be built in at least two storeys, the upper one being intended as a living place in the evening and at night; but when the gnats are hungry for blood they go up even to the fifth or top storey of a house.

Other structural conditions are to-day more necessary, whenever a house has to be built in a malarial place. Above all there should never be a dark or badly lighted part in the house. If there is such a part, as for example, in the cellars, under the stairs, in the latrines, gnats will certainly hide there. Further, it will be very useful to have a vestibule or porch in front of the main door; at least a veranda will be indispensable (see fig. 1, p. 628). The walls of the vestibule or veranda should be of fine net-work, allowing air to pass through but keeping out insects; and that the heat may not be too great, it may be well to train plants over the network, as in this way in summer time the people will be able to enjoy the cool air without suffering from the bites of the fever-breeding gnats. The porch or the veranda will be a first obstacle to the entry of these into the house. There should also be similar nettings on the doors and windows. On the latter, it is advisable that on all the storeys they should be firmly fixed and therefore unremovable; whilst on the other hand, on the doors of the porch and on the main door of the house, they should be movable, closing automatically, so that they may make the least possible demand on human apathy.

The door of the vestibule or of the outer veranda must be on the opposite side to that where, among the marshy vegetation or in some cave, the gnats take shelter during the day, and it must open in the opposite direction to the house door, so that when both are open there may not be a direct and easy way of entrance for the gnats. And the better to safeguard from these insects the rooms on the second storey, where people mostly sleep and where consequently there is greater danger of being bitten, the stairs should be provided with another door with similar netting and automatic closure. To reach the bedrooms the mosquitos will thus have three doors guarded with netting, and therefore three obstacles to overcome, which will not be easy for them to do. The balconies of the second storey, or of the windows where there are any, must also be covered and protected all round with similar nettings (see figs. 2 and 3, p. 628). The netting may be of metal or of cord. They must be of metal, that is to say of iron plated with zinc or tin, wherever they are most liable to break (doors and windows of the ground floor, outer verandas); and in order to prevent gnats from penetrating, they should be made in numerous little square meshes, each measuring 1 to 1·5 millimetre on all sides. Meshes of 2 millimetres at the side may also be used; they should be varnished so as to make the openings smaller and preserve them from rust. For this purpose brass network is very useful, but is too costly. Nettings of cord, which are the most economical if they are a little looked after, also last very well.

The walls of the rooms must be white, so that every gnat that rests on them may at once be seen. From the bed-rooms it will be necessary to remove pictures, curtains, and such articles of furniture as shelter gnats. If by chance one is heard in the night, a powder should be burnt which at any rate will stupefy it, so that afterwards in the morning it can be looked for and killed. Care should be taken that there are no holes in the floor, or if there be any, that they should be closed. Sometimes it will be necessary to cover with a metallic netting even the top of the chimney, when it is proved that mosquitos find their way in by this route; otherwise there is no need to increase the inconveniences of smoke.

It is advisable to avoid having trees about houses, as in the day-time the mosquitos hide there, which in the evening try to make their way into the houses, especially into rooms where there is a light burning.

Finally any kind of habitation in a malarious place, even to temporary sheds that can be taken down (fig. 4, p. 628) and straw huts (fig. 5, p. 628) should be protected against the invasion of mosquitos. The walls should be of netting, or be made somehow impermeable to those insects, and in every case a cage with an outer and inner door of metallic netting should protect the entrance.

With such mechanical protections, last year I for the first time made it possible for the families of railway servants to pass the whole summer and autumn in the most malarial spots of the Campagna without contracting the fever. This year I have extended a similar protection to railway servants, herds, and peasants, in the most unwholesome places of Latium; and there is no longer any doubt that it is possible to keep a house free from mosquitos, and therefore from malaria, in the regions most infected by that epidemic disease.*

There are, therefore, two essential conditions for keeping a house healthy in malarial places, namely, that in its interior there should be no dark places; and that all the outer openings, without any exception, should be protected by means of nettings against the invasion of insects. In this way in the day-time freedom from the annoyance of flies and other insects either troublesome or injurious will be ensured; and in the night-time people will be protected against the inconveniences and dangers caused by mosquitos; and in every damp place where insects multiply by myriads, the mechanical protection against their invasion of the interior of houses will become the best of prophylactic measures against malaria and against other diseases.

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* See Supplement to the "Policlinico," No. 5, Year VI., Oct. 20th, 1900.

III.—Corollaries for Agriculturists.

It must first of all be understood that any turning of the soil cannot by itself be a cause of malaria, as was believed when it was supposed that the germs of this infection lived in the ground. Thus no dry culture whatever can ever be a cause of malaria except in as far as it creates a demand for labour during the most dangerous months and hours.

Thus the temporary irrigations of dry cultures, as maize, meadows, fields, pot-herbs, oranges, lemons, etc., cannot be a cause of malaria, provided the water reaches the soil in no greater quantity than it does in a shower of rain, and the canals by which it flows in or out are not of such a character as to allow it to become stagnant.

On the other hand marsh lands or irriguous fields which are kept in a state of prolonged submersion may be a cause of malaria, not by reason of the water which is poured over the fields, and during the fever season is not left there, but by reason of the water which stagnates in the canals round the square patches of meadow. It is sufficient to see those canals only once to be forthwith convinced that, with the exception of those where the water is most frequently flowing, the others—where it rarely flows and in certain months not at all—are full of marshy vegetation which is too seldom removed, and in them therefore larvæ of the specific mosquitos abound.

This drawback might, however, be remedied either by continual cleansing of the canals or by flushing with water, that in the hot months from spring to autumn at least every 12 to 15 days would sweep out the larvæ, which being carried into the rivers and with them to the sea, there in the salt water find their death.

The irriguous system of cultivation could therefore be made compatible with the public health. Unfortunately, the same cannot be said as to ricefields.

My own experiments and those of my fellow workers in various parts of Italy have shown that ricefields, whether the water in them be stagnant, or running or intermittent, are always a favourite nidus of the *Anopheles* larvæ. On the other hand, the Paris Academy of Medicine* holds that when there is running water, ricefields are not dangerous. But the truth is, that, however much the water may run (and as a rule it runs little because it is either deficient or costs too much), there are always dead points towards the corners of the squares where there is no current, and where the larvæ prefer to remain. It may be added that the rice plants give shelter to the larvæ and oppose a great obstacle to the current which even in the middle, between the inflow and the outflow of the water, is always sluggish. It is therefore a delusion to believe that by increasing the velocity of the water (a thing which is not always possible) a ricefield can be made healthy. Further, in the afferent and efferent canals which intersect the ricefields the water here and there is stagnant, and there the most luxuriant marshy vegetation grows undisturbed.

Altogether, therefore, a ricefield of whatever type presents every condition it is possible to imagine best adapted for the life of *Anopheles* larvæ.

Nor can this be avoided by intermittent submersion, since leaving aside the consideration that this may be agriculturally injurious, it is a fact that on the days when the water is withdrawn, the earth always remains wet, either all over or in the most sloping parts, and thus the larvæ for the most part are able to resist while waiting for the return of the vivifying stream, and the nymphs develop more readily in aërial mosquitos. Hence it is not possible to improve rice culture hygienically by such hydraulic operations. Will it ever be possible to reconcile the economic advantages of that culture with the public health?

A collaborator of mine, Dr. Fezzi, near Crema, has by numerous experiments proved that the colouring matter which by antonomasia is sold under the name of "Larvicid" † may very well repeatedly destroy the noxious mosquitos in ricefields without damaging the useful plants, a result which is not obtained by the use of other substances that destroy larvæ, such as petroleum and chrysanthemum flowers. In practice, however, such specific disinfection of ricefields will not be carried out till it has been shown that Larvicid cures some disease of the rice, or when it is necessary to combat one of those diseases by a substance that is a truly effective larvicide.

In accordance with the new researches, the dominant ideas as to the relations between macerations of textile plants (hemp, flax) and malaria, must be completely changed. Indeed, it is now indisputable that such macerations are hurtful to the *Anopheles* larvæ which perish in them, whilst the common gnats multiply abundantly therein. The water in the macerating tubs, before and after maceration, may, like other water, feed the specific larvæ, but the life of these, and therefore the danger of malaria, ceases as soon as maceration is well advanced.

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* Loc. cit., p. 620.

† It is prepared by the firm of Weiler-ter-Meer of Uerdigen a/R.

Does the culture of shrubs, and in general of trees, favour the propagation of malaria, or does it not? It can no longer be maintained that, at any rate among us, there exist culicifuge trees, and that of this nature, as the Paris Academy of Medicine* persists in believing, are the pine and the eucalyptus. These and our other trees are, on the contrary, shelters for the insects of the air, and therefore in the neighbourhood of houses, as in our railway cottages, they rather entail a danger of malaria.

On the other hand some herbaceous plants, chiefly the closed flowers of the chrysanthemums of Dalmatia and Montenegro, from which are prepared the so-called insecticide powders, are effectual in killing the larvæ in water and the mosquitos in the air. If it were possible to cultivate these plants on a large scale, it might be possible also to contrive that the malarial place itself should produce as much as would suffice to free it from the mosquitos by which it is infested.

Lastly, *intensive cultivation* is notoriously that which best reconciles hygiene with rural economy. And how this is so we are now in a position to explain. Dry soil, temporary irrigations, strict conservancy of the canals, even the foul liquids of natural manures, are so many conditions unfavourable to the life of the larvæ of the fever breeding mosquitos. And thus it is understood how, wherever it has been possible to secure all this, intensive cultivation has brought economical prosperity and health to wretched and inhospitable waste lands.

IV.—BRIEF NOTIONS OF PROPHYLAXIS FOR LABOURERS IN MALARIOUS PLACES.

It is altogether to the interest of engineers and agriculturists to safeguard the health of him who works for them much more than he does for himself. It is well, therefore, that they should know how they can and ought to do this. It is obviously necessary that, in every primary and recurrent case of malarial fever, treatment by means of quinine should be prompt, as complete as possible, and therefore prolonged and gratuitous. But with all this I have shown that we do not always succeed in preventing relapse and therefore in destroying malaria, as was hoped by Koch, and at first also by Grassi. It would be necessary to destroy the mosquitos, but on a large scale this is not easy, and at present it is not possible—among other things because the various systems of hydraulic improvement for the most part do not, as we have seen, succeed in limiting the conditions of life of the insects.

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* Loc. cit., p. 620.

Means should therefore be taken to prevent the mosquitos when they bite inoculating the disease, and this is possible. For this purpose protection of the houses in the manner above described answers very well.

A further means is to protect the uncovered parts of the bodies of those who have to remain in the open air during the hours of the evening and night. And as culicifuge soaps, pomades, and scents are of no use, it is necessary to have recourse to mechanical contrivances (veils, gloves) which are suitable for those who have to watch, but are ill-adapted for work, especially for agricultural labour.

Nor will it be easy—and in certain seasons on account of the inclemency of the weather it will perhaps even not be possible—to shorten or do away with the hours of evening or night work. On that account the prophylaxis of agricultural labourers will not be complete until it is possible to confer on them an artificial immunity. By chance I have met with a case or two—but much too rare and not always lasting—of natural or congenital immunity in regard to malaria. I have also described cases of lasting immunity following a long period of suffering from the disease. The mechanism of this immunity, however, is not known; nor have I been able to reproduce it by experimental injections of blood serum and organic juices.

On the other hand, I have found that by taking daily half a gram of euchinin one becomes capable of bearing with impunity the injection of a large quantity of very virulent malarial blood. And this year I carried out such a medicinal prophylaxis by means of euchinin on a vast experimental scale among country folks and railway servants.

Unlike quinine, this remedy is perfectly borne without any disturbance, every day for four months on end, and the results were so good that I hope it may be possible to place the drug on the market at a price low enough to allow the largest use to be made of it.

This is what at the present time medical science can suggest with greatest certainty for the use of the engineer and the agriculturist in regard to malaria.

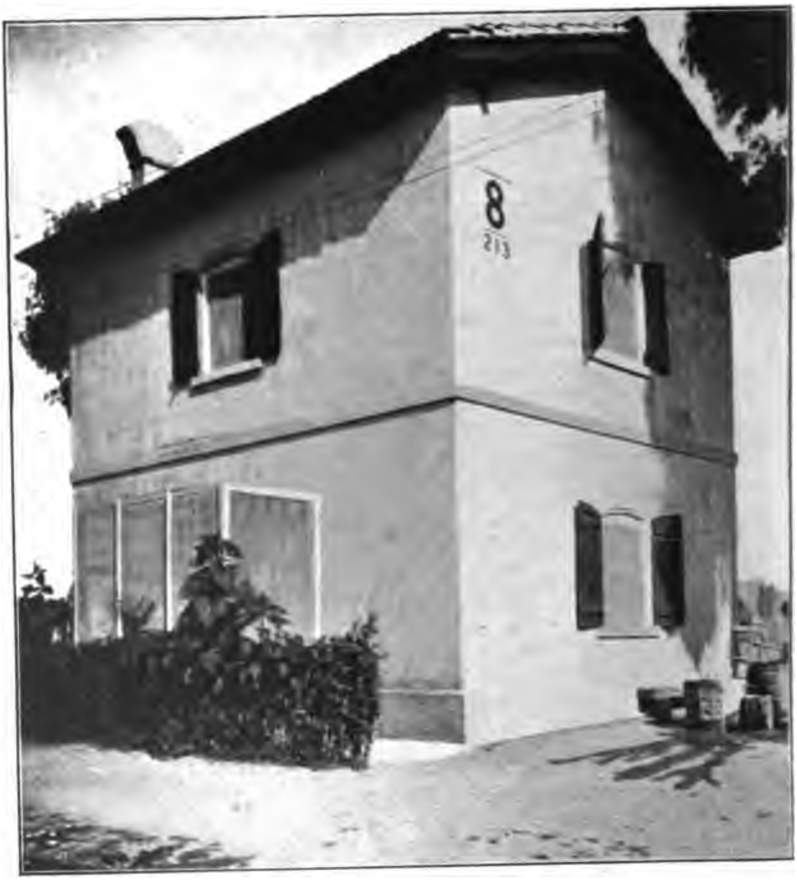

Fig. 1.

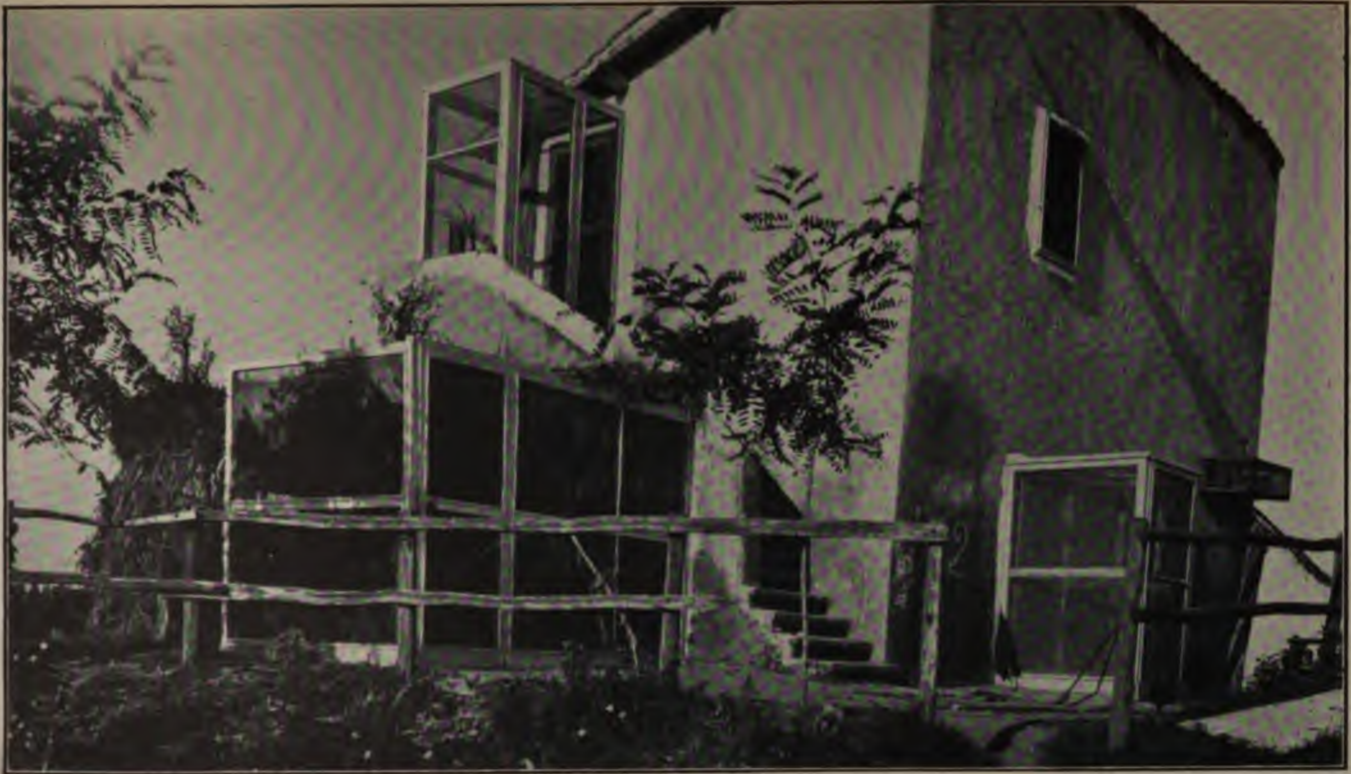

FIG. 2.

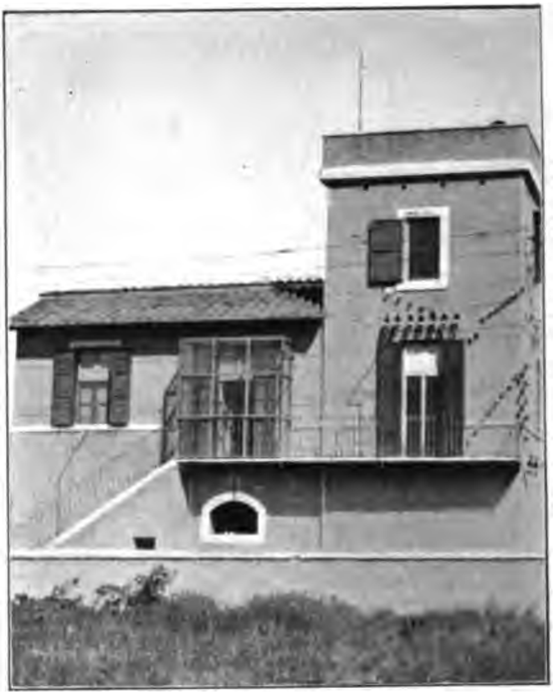

Fig. 3.

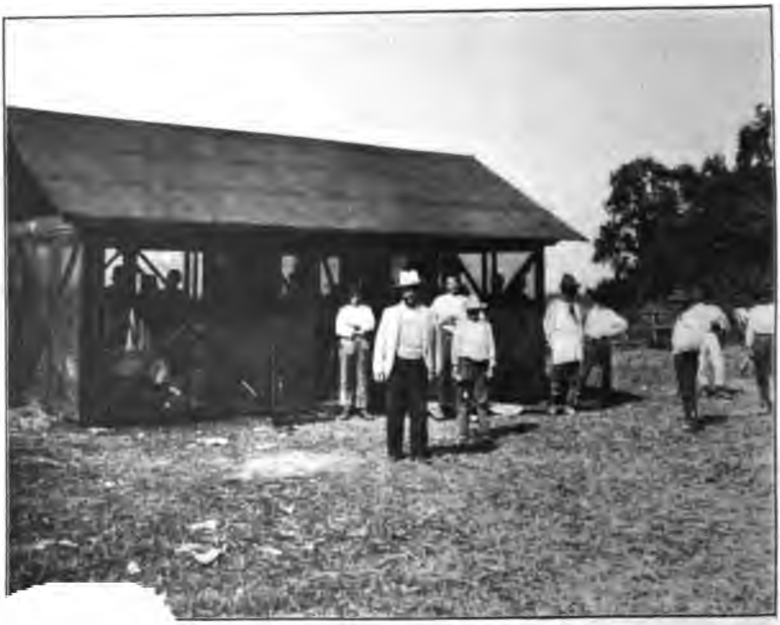

Fig. 4.

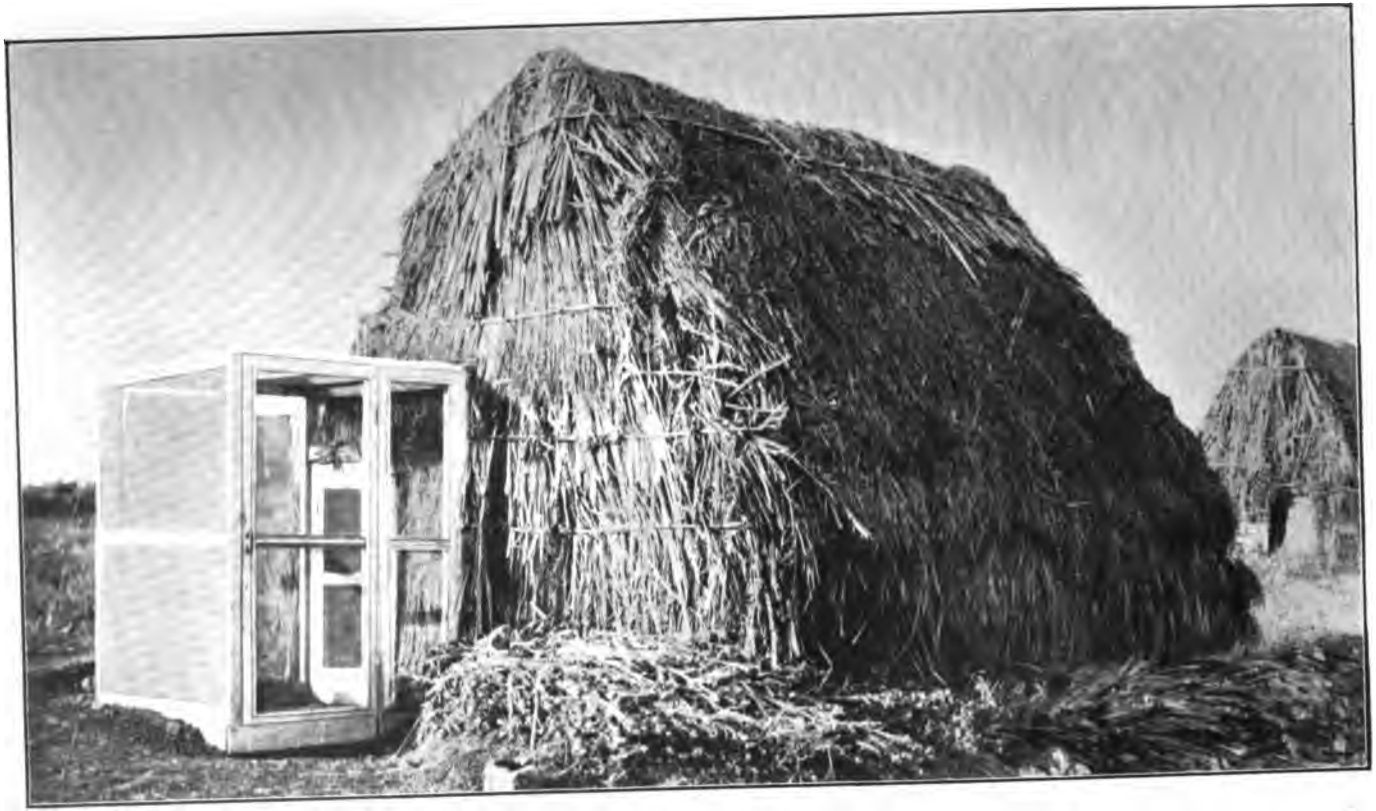

FIG. 5.

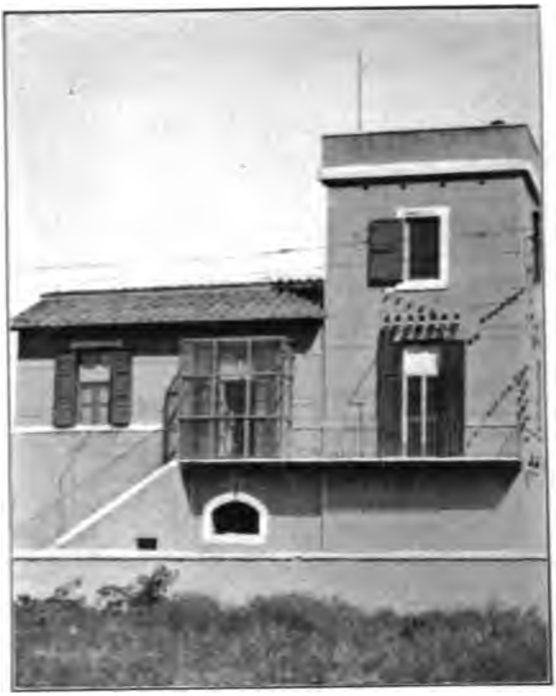

Fig. 3.

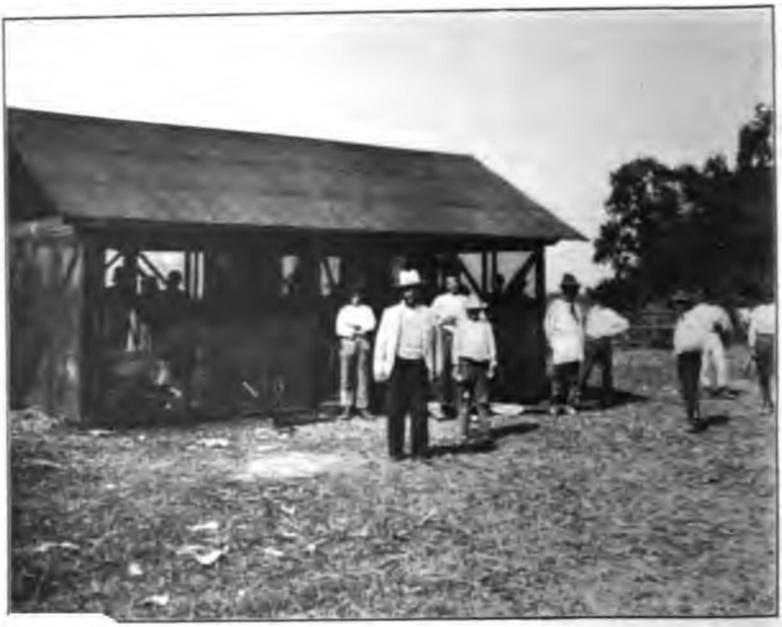

Fig. 4.

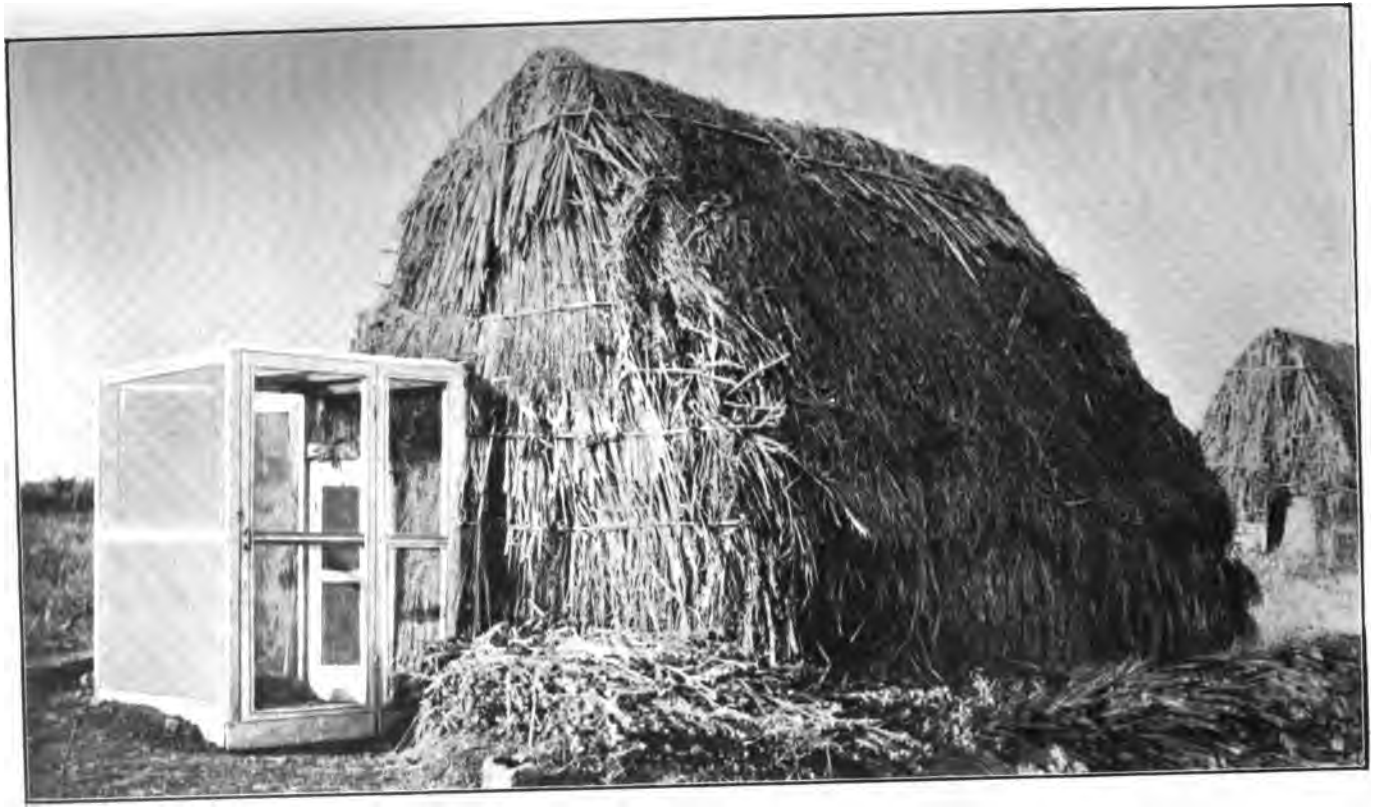

FIG. 5.

ARTICLES RELATING TO PUBLIC HEALTH,

Appearing in the chief British and Foreign Journals and Transactions.

Abstracts of Titles classified in this List under the following headings:—

Science in Relation to Hygiene and Preventive Medicine.
Hygiene of Special Classes, Trades, and Professions.
Municipal Administration.
Building Materials, Construction, and Machinery.
Water Supply, Sewerage, and Refuse Disposal.
Heating, Lighting, and Ventilating.
Personal and Domestic Hygiene.

The articles referred to in this list are as far as possible collected and filed in the Library of the Institute for the use of the Members and Associates.

Science in relation to Hygiene and Preventive Medicine.

KLEIN, E. Zur Kenntnis der Verbreitung des Bacillus tuberculosis und pseudotuberculosis in der Milch sowie der Biologie des Bacillus tuberculosis. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVIII., p. 111.

(1) Inoculation experiments (guinea-pigs) with London railway station milk; in 42 no result, in 8, death from an acute infection, in 7, tuberculosis, in 8, pseudo-tuberculosis. (2) virulence of tubercle bacillus increased by cultivation in milk.

KLETT, Dr. ADOLPH. Die Sporenbildung des Milzbrandes bei Anaerobiose (Spore formation of Anthrax under anaërobic conditions). *Zeitschrift für Hygiene und Infectionskrankheiten*, Bd. XXXV., Heft 3, p. 420.

The author concludes from his experiments that the formation of spores of Anthrax is not limited to the presence of oxygen, as large numbers of them are formed in an atmosphere of nitrogen, and that further, during cultivation in hydrogen, the spore formation is at a standstill, as the latter gas exerts a detrimental influence.

LOEFFLER, Prof. Dr. Zehnter internationaler Congress für Hygiene u. Demographie zu Paris, 10 bis 17th August, 1900. (Tenth International Congress of Hygiene and Demography). *Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4 (2) p. 674.

This is an interesting report on the work of the first section: "Microbiology and Parasitology in their applications to Hygiene."

Luzzatto, Angelo (Graz). Zur Aetiologie des Keuchhustens. *Cent. f. Bakt., Parasit., u. Infektkrnkht*, Bd. XXVII. p. 817.

Evidence that Koplik's bacillus is most probably the specific cause of whooping cough, and not Czaplewski's.

Macfadyen, Allan, M.D., B.Sc., and **Rowland, Sydney**, M.A. The detection of the Tubercle Bacillus in Dairy products. *The Journal of State Medicine*, October, 1900, p. 684.

Markl, Dr. (Bezirksarzt in Ministerium des Innern, Berlin). Einige Ratschläge für die Einrichtung und den Betrieb der Pest laboratorien. *Cent. f. Bakt., Parasit., u. Infektkrnkht*, Bd. XXVII. p. 611.

The construction and organisation of a laboratory for bacteriological examination of cases of bubonic plague, and the precautions necessary to be observed in its administration.

Matzuschita, Dr. **Teisi**. Die Einwirkung des Kochsalzgehaltes des Nährbodens auf die Wuchsformen der Mikroorganismen. (Influence of the presence of common salt in nutrient media upon the growth of micro-organisms). *Zeitschrift für Hygiene und Infectionskrankheiten*, Bd. XXXV., Heft 3, p. 495.

The author concludes that the influence of common salt in nutrient agar upon the form of growth of micro-organisms is a very varying one. Whilst some can stand an addition of 10 per cent. of common salt, there are others which show remarkable forms of degeneration with a much smaller percentage, Hankin-Leuman's test for the bacillus of plague is a very valuable one.

Mayer, George. Zur Kenntnis des Piorkowski'schen Verfahrens der Typhus-diagnose nebst einschlägigen Modifikationen. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVIII., p. 125.

Method of using urine gelatine for the recognition of the b. typhosus in cultivation.

Nakanishi, K. (Kyoto). Bacillus variabilis lymphæ vaccinalis, ein neuer konstant in Vaccinepusteln verkommender Bacillus. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVII., p. 641.

Description of a bacillus, very variable in form when growing under different conditions, found constantly in the vaccine pulp from calves and in lymph from children. Not pathogenic to calves owing, it is suggested, to loss of virulence.

Schlesinger, Dr. Eugen. Die Leukocytose bei experimentellen Infectionen (Leucocytosis during experimental infections). *Zeitschrift fur Hygiene und Infectionskrankheiten*, Bd. XXXV., Heft 3, p. 349.

This paper is contained in 53 pages, and attached to it are the results (tabulated) of thirty-five animal experiments, which were made with a view to ascertaining the behaviour of the leucocytes under certain conditions. For this purpose the total number of leucocytes, and also the relative and absolute numbers of the several forms of leucocytes were determined.

Solomon, Véra. Experimentelle Untersuchengen über Rabies. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVII., p. 70.

1. Investigation of the methods of inoculating rabies (*a*) into the cerebral substance (Leclainche-Morel), and (*b*) by rubbing forcibly on the mucous membrane of the nose (Galli-Valerio—Solomon); both methods recommended. 2. Dog's bile has a greater or less neutralising effect on the virus of rabies, not antitoxic but antiseptic. (From Prof. Galli-Valerio's laboratory, Lausanne.)

Stühlern, V. (St. Petersburg). Beitrag zur Bacteriologie der lobären Typhus-Pneumonien. *Cent. f. Bakt., Parasit., u. Infektkrnkht.* Bd. XXVII., p. 353.

In lobar pneumonia complicating typhoid fever the typhoid bacillus, though not the determining cause of the pneumonia, is present in the lungs, and is voided with the expectoration.

Von Ratz, Stefan. Die Widerstandsfähigkeit des Virus der Tollwut gegen Fäulnis. *Cent. f. Bakt., Parasit., u. Infektkrnkt.*, Bd. XVII., p. 825.

When a rabbit is inoculated with material from a decomposing body of an animal dead of rabies the incubation period is longer, and the disease more protracted, than when fresh material is used.

Embrey, G. Detection of Maize in Wheaten Flour. *The Analyst*, December, 1900, p. 315.

The variations in the chemical composition of the flours are not sufficiently wide to enable an estimate of one to be made in the presence of the other, and the microscope does not enable concordant results in quantitative estimations to be made. The author recommends a chemical test which enables an estimation to be made within an error of five per cent.

Fermi, C., and Lumbao, S. (1) Befreiung einer Stadt von den Mücken; (2) Beitrag zur Prophylaxis der Malaria. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVIII., pp. 179–186.

(1) Relative values of various culicicides for water of cisterns,

troughs, &c.; petroleum best in practice. (2) Relative values of various reputed culicifuges applied to the person.

HALL, A. D. On Uniformity in Soil Analyses. *The Analyst*, November, 1900, p. 281.

Embodies the recommendations which have been drawn up by a Committee of the Agricultural Education Association, with the aim of securing a certain uniformity in the conduct of soil analyses.

THE "ANALYST." The Margarine Clauses of the Food and Drugs Act, 1899. December, 1900, p. 409.

Is a report by a Special Committee of the Society of Public Analysts appointed at the suggestion of the principal chemist of the Government Laboratory, to confer with him on the subject of section 8 of the Sale of Food and Drugs Act, 1899. The object of the Conference was to arrive at an agreement as to the mode of estimating the proportion of butter-fat in margarine. The Reichert-Wolling method is selected, and full directions given for performing it.

HESSE, Dr. W. Ueber einen neuen Muttermilchersatz; Pfunds' Säuglingsnahrung. (A new substitute for mother's milk: Pfund's food for children). *Zeitschrift für Hygiene und Infectionskrankheiten*, Bd. XXXV., Heft 3, p. 439.

The author examines the various substitutes for mother's milk, and condemns all preparations in which flour is used. He is of opinion that an artificial mother's milk should be prepared with cow's milk, and gives the composition of such a substitute, which he recommends.

WILLIAM HUNTER, M.B., C.M. The Serum Diagnosis of Typhoid Fever. *The Journal of State Medicine*, October, 1900, p. 688.

LUTTINGER, LUDWIG. Der Typhus in Czernowitzer Stadtgebiete während der Zeit vom Jahre 1892 bis ende 1899. *Cent. f. Bakt., Parasit., u. Infektkrankht.*, Bd. XXVIII., p. 229, 294.

Statistics of typhoid fever in a town supplied partly by waterworks, and partly by wells and streams.

OGATA, M. (Tokyo). Ueber die Pestepidemie in Kobe. *Cent. f. Bakt., Parasit., u. Infektkrnkht.*, Bd. XXVIII., p. 165.

Bacteriological diagnosis that an epidemic of acute disease in Kobe in November, 1899, was plague. From November to January 41 cases, with 39 deaths (14 cases pneumonic plague).

SPIESS, Dr. A. Repertorium der im Laufe des Jahres 1899 in deutschen und ausländischen Zeitschriften erschienenen Aufsätze über öffentliche Gesundheitspflege. *Deutsche Viertel-*

jahrsschrift für öffentliche Gesundheitspflege, Bd. XXXII., Heft 4 (2), p. 725.

This is a most useful index of all the literature which has appeared in 1899 on the subject of hygiene. Systematically classified for easy reference, the author mentions in 211 pages every paper (in the German, English, French, and other languages) bearing upon hygiene which has been published in 1899.

Zimmermann, Dr. F. W. R. Zehnter internationaler Congress für Hygiene u. Demographie zu Paris, 10 bis 17 August, 1900. (Tenth International Congress of Hygiene and Demography). *Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4 (2), p. 713.

This is a report on the work of the section for Demography.

Dalton, John P. The rate of rainfall. *The Surveyor*, July 27th, 1900, pp. 108 & 199.

Results of observations to ascertain the different rates of which rain of varying degrees of intensity is deposited—Different characters of rainfall.

Hygiene of Special Classes, Trades and Professions, and Municipal Administration.

Aust, Dr. C., Ueberbüdung und Schulreform (Overwork and School-reform). *Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege*, Bd. XXXII., Heft 4 (2), p. 649.

This is a very interesting paper. After a lengthy critical review of the modern systems of education the author comes to the conclusion that the pupils are overworked in the higher grade schools. All school-reform, so he sums up his remarks, must tend to adapt the instruction to the requirements of the time without causing overwork in any form.

Schultz, R. W., and **Howard**, E. P. General Hospital, Stobhill, Glasgow. *The Builder*, Sep. 8th, 1900, p. 214.

Description, with plans, of the first premiated design.

Shaw, John. Presidential address. *The Builder*, Nov. 17th, 1900, p. 442.

Part of this address touches upon difficulties cropping up in rural districts now under by-laws really applicable to urban districts only.

Alford, Robert C. Sanitary conditions of Hong Kong. *The Engineering Record*, Oct. 20th, 1900, p. 370.

Abstract of paper published by Institution of Civil Engineers.

"THE BUILDER," EDITOR OF. Sanitary condition of Windsor. *The Builder*, Oct. 6th, 1900, p. 286.

An editorial article referring to Dr. Bulstrode's report to the Local Government Board on this subject, and on the character of the Town Council's administration. The article concludes by stating that the state of things disclosed in the report "seems a national disgrace."

LONGDON, O. W. Oiled roads. *The Engineering Record*, Nov. 24th, 1900, p. 490.

The experience of two years sprinkling of the roads in Los Angelos with oil instead of water. Its advantages.

WHINERY, S. Economics of Street Paving, Part I. and Part II. *The Engineering Record*, 11th August, 1900, p. 127, and 18th August, 1900, p. 148.

Enquiry into cost of various systems of street paving. Initial cost. Maintenance. Life. Ease of traction. Cost of cleansing. Sanitary qualities. Comfort.

Building Materials, Construction and Machinery.

ELLIOTT, A. C., D.Sc.Edin., M.I.C.E. Strength of Bricks and Brickwork. *The Surveyor*, August 3rd, 1900, pp. 142 & 3.

Variable quality of masonry materials; early experiments as to crushing strength; experiments of American engineers; of the Royal Institute of British Architects; results of the author's experiments; testing machines.

FAIRLEY, W. Sewage Pumping Machinery at Richmond. *The Surveyor*, August 24th, 1900, pp. 224 & 5.

The sewers under the Richmond Main Sewerage Board. Pumping machinery. Engines. Boilers. Super-heater. Results of trials.

Water Supply, Sewerage and Refuse Disposal.

BEER, E. Water Filtration in Germany. *The Engineering Record*, 3rd November, 1900, p. 416.

Translation of parts of paper showing the present position of the question in Germany.

CROES, JAMES M.Am.Soc.C.E. The Use and Waste of Water. *The Engineering Record*, 1st and 8th September, 1900, pp. 196, 227.

Underground leakage. Amount of water used for public and private purposes. Meter records. Effects of pressure. Methods of localizing and preventing waste.

Jenkins, A. J., A.M.Inst.C.E. The Relationship between the Cost of Water Wasted and the Cost of Detection and Prevention of Waste. *The Surveyor*, July 20th, 1900, pp. 68 and 69.

The waste of water. Use and misuse. Cost of water. Waste inspection. Use of stop taps. Stethoscope. Sources and extent of waste. Meter testing. Reliable statements of cost of detection and prevention of waste.

Watson, James, M.Inst.,C.E. The old and new Water Supply of Bradford. *Building News*, September 7th, 1900, p. 314.

Rainfall. Gravitation versus pumping. Quality of water. The earlier water-works. New works. Storage reservoirs. Aqueducts. Tunnels. Service reservoirs and filters. Description of work.

"Builder," Editor of the. Editorial article on the Leeds Experiments in Sewage Disposal. *The Builder*, September 8th, 1900, p. 207.

Results of three years investigations, made by Mr. W. J. Dibdin and Mr. W. H. Harrison, at the cost of the Leeds Corporation, with a view to ascertaining the best methods of bacterial purification.

Frankland, P. F., Ph.D., F.R.S. The Purification of Sewage. *The Journal of State Medicine*, October, 1900, p. 671.

Deals mainly with the biological purification of sewage.

Kemp, J., A.M.I.C.E. Sewerage and Sewage Disposal Works at Hampton-on-Thames. *The Surveyor*, October 19th, 1900, p. 456.

Statistics of Hampton. Site of sewage works. Division of district into sewage areas for main sewers. Disposal works. Bacteria beds. Buildings.

Richardson, F. W. Bradford sewage and its treatment. *The Builder*, Sep. 15th, 1900, p. 231.

The paper was read in the Chemistry Section of the British Association, and specially refers to treatment of woolcombers' suds.

Royle, H., A.M.I.C.E. Conditions necessary for successful purification of sewage by land treatment. *The Surveyor*. July 20th and September 1st, 1900, pp. 84, 194.

Good soil of great importance. Efficient under-drainage. The Stretford sewage farm. Depth of under-drains. Drain laying. Management of a sewage farm.

Gregory, John H., Am.Soc.C.E. Diagram giving discharge of pipes by Kutter's formula. *The Engineering Record*, Nov. 3rd, 1900, p. 415.

McTaggart, John. Disposal of House Refuse in Bradford. *Engineering*, 14 Sept., 1900, p. 326–7.

Destructors. Quality of refuse. Utilization of clinker. Utilization of steam produced. Newest type of destructor.

Smith, Shrapnell E. Motors for Street Watering and Dust Removal. *Engineering*, 14 Sept., 1900, p. 353.

Results of trials at Chiswick. Comparisons between motor and horse haulage. Strand District Board of Works statistics.

Heating, Lighting, and Ventilating.

Monroe, Wm. S. Modern Practice in Steam Heating and Ventilation. *The Engineering Record*, 15 Sept., 1900, p. 254.

Systems of mechanical ventilation applicable to public buildings.

Personal and Domestic Hygiene.

Babucke, E. Ueber die Desinfektion mit Typhusbacillen infizierter Badewässer. *Cent. f. Bakt., f. Parasit. u. Infektkrnkht*, Bd. XXVII., p. 800.

A bath used for bathing patients suffering from typhoid fever is best disinfected with chloride of lime (about half-a-pound), which does not injure the bath.

Brunn, W. von. Alkoholdämpfe als Desinfektionsmittel. *Cent. f. Bakt., Parasit., u. Infektkrnkht*, Bd. XXVIII. p. 309.

Disinfectant action of vapour of alcohol (50 to 75 per cent.) and water, about equal to that of steam. Vapour from water containing more or less alcohol less effective.

Flick, Carl. Ein Kontrollversuch zur Glykoformal-und kombinierten Paraformaldehyddesinfektion. *Cent. f. Bakt., Parasit., u. Infektkrnkht*, Bd. XXVIII., p. 244.

Superior penetrating and disinfecting power of glykoformal (10 per cent. glycerine).

REVIEWS OF BOOKS.

MONOGRAPHS ON EDUCATION IN THE UNITED STATES.*

The broad basis upon which education should stand, and the important part that a knowledge of child-life should take in all educational schemes, is now more generally understood, but it appears from these monographs that America is well in advance in setting out the methods which should be pursued to gain these ends.

Much in these monographs has reference to those excellent institutions, the normal schools—of which there is now a large number in North America. These schools have been erected and are supported to the end that children may have better teachers, and with that object in view every effort is made to inspire the student with the spirit of the teacher while he is carefully led through the educational study of the subjects of the public school curriculum, that he may learn how to use each in the teaching process, and thereby learn the method of teaching. He must learn to think the object as the learner thinks it, he must also think the process by which the learner knows, and the means he is to use to cause the learner to take the steps of this process. It is sought to make teaching rational and not empirical, and to lead the teacher through the broader study of man, body and mind, to find the principles of education which are derived from this study and which must underlie all true teaching.

A good example in the method of teaching teachers practical psychology is given in the monograph dealing with "Work of Normal Schools."

It is shown that is not enough for the teacher to have knowledge of a bird in order to teach its structure, life, and habits. The teacher must also have knowledge of the child's knowledge of birds in general, knowledge of how a child thinks of birds he already knows, knowledge of how a child assimilates the knowledge it is given. The teacher must then think the new facts to be learned from the child's standpoint of thought, he will then be able to carry the child's mind on a step further. Thus studying a subject as a teacher is much more than studying a subject as a learner, and such training schools for teachers must be largely concerned with the "educational study" or "teaching study" of the subjects the teacher is to be trained to teach.

Ample opportunity is given in these normal schools for the teacher to live in an atmosphere of good teaching in all its grades, and ample opportunities for practice in teaching, under supervision, are afforded. In teaching, the individuality of the pupil is to be respected and the aim is the development of the individual according to his needs.

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* **Twelve Monographs on Educational Subjects issued by the Commonwealth of Massachusetts, and twenty Monographs issued by the Department of Education for the United States Commission to the Paris Exhibition of 1900. New York.**

The art of teaching is to unfold and perfect human individual lives, and to incite the learner to right living. A young teacher has not all this power but he may be led to strive for it, and the best teacher may improve himself. An incompetent teacher wastes the child's life in ignorant attempts to teach him.

Physical training is felt to have a wider scope than that formerly ascribed to it. It embraces all the physical manifestations of the child. The school must send the children forth with at least as good health as that which they bring. Regular habits in eating, sleeping, exercise, work, recreation, must be practised, and the work so planned as to allow not only daily relaxations, but a larger measure of weekly relaxation. Why not make a business of this physical training, and treat children as though we considered them as important as algebra or physics? Why not drop or refuse to promote higher education amongst those with persistent headaches, indigestion, female weaknesses, hysteria, nervousness, etc.? Many of these dangers to health arise mainly from over anxiety, and lack of regular out of door exercise, and also from a lack of definite understanding regarding length and number of hours for study for each subject, the amount of time spent in copying notes and similar matters—the best teachers being often the worst offenders.

The child's standpoint in education is referred to in the paper on the teaching of physics and chemistry, in a remark that the latest scientific discovery in all its historical bearing is not so valuable to the teacher as the ability to interpret to his pupils everyday occurrences. In the monograph it is the student who is being discussed, but the same is true of the child. "To begin at the beginning" with the child is not to give it the history of a matter in sequence but it is to lead it to find the thought underlying the concrete fact it is examining. For instance, the beginning of English history to the child may be the thought, "what makes this woman who is now passing me in the park differ from other women so that she is called a queen," much rather than by a recital of the facts of the Norman Conquest.

Much valuable suggestion is given as to the teachers' note-books. and their illustrations, as bearing upon the educational or teaching purpose for which they are being prepared, and as to how a knowledge of information from magazines, scientific articles, etc., may be stored up; and the monograph naturally concludes with the importance of a knowledge of nature being allied to a love of nature.

It is found that the general truths of psychology and child study, so far as formulated by scientists, when learned by teachers from books or from didactic teaching, usually fail to be practically applied in the school-room, unless training has already been given in the application of those truths.

While every human being who has associated with children has acquired almost unconsciously a large number of general truths concerning childhood, and has, at the same time, learned practically to apply them, what we need in training, is to cause our students to become more conscious of the truths they already know, more interested in the study of mental activity, to form habits of continually noting and interpreting mental facts, and above all to acquire skill in correctly and tactfully applying general principles to particular cases, so as best to promote the development of a school, class, or individual.

A teacher's success lies in quickly perceiving these mental differences in scholars rather than in depending upon the knowledge of what is generally true of mental activity at certain ages; and this is gained by experience as a teacher rather than in a training college. Still, in the normal school, opportunity should be given for the teacher to practise in applying the knowledge of general truths to particular cases. A clever doctor is shown more by practical judgment of symptoms of patients, than by his knowledge in general of diseases and remedies.

The process of training on the concrete in the vexed question of grammar is well set out in the account of the Lowell Normal School. If you apply the beginning of things to grammar, you find the use of a sentence is to express a thought. Then the pupil gets some knowledge of the process of thought, and discovers the three elements necessary in every thought, sees them expressed in the threefold nature of the sentence, finds the kind of ideas the mind uses in thinking; and so in short grammar becomes based on the elements of logic. Dr. Harris gives it its true and high position when he says grammar defines and fixes speech, and by mastery over it man obtains the first mastery over his mind as an instrument.

The Monograph on School Architecture and Hygiene is an interesting and valuable contribution to a subject the importance of which it is difficult to exaggerate. The writer of the monograph is an advocate for more space than is generally allotted to each scholar in our public elementary schools, because the child is the most important factor in a school; when a certain cubic area is found necessary to guard the health of the scholar, then the school must be made to conform to such requirements. It is impossible to believe that the class-rooms of our Board Schools, when occupied by the full allowance of scholars, represent a proper balance between the economic and the pedagogical phases of this question.

Some apparent errors in judgment are to be found in certain of the monographs, and these appear to arise from the great difficulty all good teachers must suffer from, for still another generation,—the difficulty of not doing to others as they have been done by. For instance, it is recommended in one monograph that all children except the tiniest should prepare beforehand the recitation in reading or literature they are going to take with the teacher; and this recommendation comes from the same teacher who says her reason for not allowing pupil teaching in literature, is that she cannot allow a beautiful poem to be so handled that the fragile flower is crushed and the bloom and delicate loveliness taken from it. The writer of the monograph, trammelled possibly by old methods, does not seem to see that in order that the child may gain this beautiful impression from the literature lesson, it must be given when his whole nature is in repose, and he should not be made to undertake the, to him, difficult and irksome task of reading and digging for the sense of the poem before he can enjoy it.

In the State Normal School, Hyannis, Massachusetts, the attempt is made to place the government of the school on the shoulders of the governed, on the theory that self-government develops character. Each student is expected to feel responsible for the welfare of the school. Habits of regularity—particularly in eating, sleeping, study, and recreation—are considered of prime importance, and regulations covering these points have been adopted by the students who board at the dormitory.

The need for more broadly trained teachers in household arts is felt in the public schools, and the Mary Hemenway Department of Household Arts has been established to supply the need. It holds that the tuition must be based on a substantial foundation of physiology, chemistry, and hygiene, and therefore any well-arranged curriculum of a school of household arts must be based upon a substantial foundation of these subjects.

In the University of Michigan the theory is held that courses in education are just as informing and disciplinary to the students as courses in cognate subjects, hence the Chairs of Education in colleges and universities. But we regret to find that the practical work here is considered of much less account than that concerned with books and theory. A diploma may be gained by the teacher who complies with the following requirements for a university degree:—Eleven hours of work in the department of the science and the art of teaching, and a teacher's course in some other department of the University.

New York University School of Pedagogy aims to furnish graduate work equal in range to other professional schools, that is to say, thorough and complete professional training for teachers. The instruction is set out to include four major and eight minor courses. History of education, physiological and experimental psychology, analytical psychology, history of philosophy, physiological pedagogics, elements of pedagogy, comparative study of national school system, æsthetics in relation to education, sociology in relation to education, the ethics of pedagogics, school organisation, management, and administration. But we learn that the degree of Master of Pedagogy is conferred upon candidates who have completed five of the foregoing courses, and the account ends with almost a startling aside that there is no practical teaching, but opportunity is given for the critical observation of selected schools.

Moreover, the Washington Committee of July, 1898, set out in much detail the course of study to be followed by students working for a teacher's diploma, and ended with the casual remark: "The Committee also recommend that the candidate shall, *if possible*, have had some instruction in the school of observation or practice."

On the whole, however, evidence is given in these monographs of the performance of a very large amount of excellent educational work in the United States, and it is not too much to say that their educational system and methods are, generally speaking, more intelligently conceived and carried out than in this country.

The collection of monographs will amply repay careful study on the part of teachers and all interested in education. They set out in detail, and with many interesting and suggestive illustrations from practical experiment, the principles of advanced educational methods underlying the syllabus which the Sanitary Institute have prepared for school teachers. One would have liked, however, to see a monograph on the question of mental and moral health in education,—a subject which forms a part of the syllabus of the examination of the Institute, and which though so all important is so frequently overlooked.

H. R. K.

A PRACTICAL GUIDE FOR SANITARY INSPECTORS.*

This book may fairly claim to fulfil the promise of its title, and although it consists of only 252 pages it contains a large amount of information valuable to the Inspector. The plan adopted has been to write the book around the Public Health Acts, and as these may be said to form the Inspector's bible, the plan is not without advantage. The more important sections of the Acts are given, followed by short explanations of the various powers, &c., conferred, while chapters are devoted to such practical subjects as "Measurement of cubic space," "Testing drains," "House inspection," "Food inspection," and "Disinfection." In a book of this size it would be impossible to deal fully with such important matters, but the information given is generally accurate and up to date; and as it is only intended as a guide to the Inspector in carrying out his duties, and not as a text-book of hygiene, it undoubtedly fulfils the design of its author. Some excellent advice is given to the young Inspector as to the method of performing his duties, which might be read with advantage by Inspectors no longer junior.

Few controversial points are introduced, though the statement on p. 71, that trough-closets are best for big schools, factories, workshops, &c., can hardly be generally accepted at the end of the year 1900, any more than the statement that earth-closets are useful *in houses* would be generally adopted by up-to-date sanitarians.

The book is well got up, and typographical errors in it are few, though we think the presence of a few well-executed illustrations would materially add to its usefulness.

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* By Frank Charles Stockman. London, Butterworth & Co., and Shaw & Sons, 1900. 8vo., 252 pp. Price 5s.

A short introduction has been written by Dr. H. Kenwood, who gives some excellent advice on the performance of their duties by Sanitary Inspectors.

A. B. H.

THE THEORY AND PRACTICE OF HYGIENE (NOTTER AND FIRTH).*

It is now some five years since the work of the late Edmund Parkes, as subsequently enlarged and edited by the late Professor de Chaumont, was thoroughly revised and almost rewritten, and appeared as a new work by Notter and Firth; and it is not too much to say that even those who are most intimately acquainted with the original work of Parkes would trace with difficulty any relationship between that volume and the present one. This circumstance is a striking object lesson of the great advances which have been made in the theory and practice of hygiene during even the past twenty-five years.

When issued as "Parkes' Hygiene," the book occupied the proud position for many years of being *facile princeps* among those publications which dealt with the same subject, and the present work will still maintain, as it deserves to, a position in the very fore-front of such publications. It is a work which may be consulted, with confidence, on all matters of public health, by teachers and advanced students; and such being the case, the bulk of the volume and the scope of treatment of the subject matter must of necessity tell against its general use as a text-book for the majority of students.

Although the new edition contains much fresh matter, this improvement has been effected without materially increasing the size of the book, and the present volume contains only fifty-one more pages than the last edition.

Some of the more important respects in which the new edition differs from the last are as follows:—Major Horrocks has contributed a lucid and valuable section, of thirty-nine pages, dealing with the subject of the bacteriological examination of water; the various methods and devices for promoting the biological purification of sewage have been incorporated and suitably dealt with; the chapters upon Water Supplies, Infective Diseases, Disinfection and Vital Statistics have been to a large extent re-written and the scope of treatment somewhat extended. On the other hand, the chapters dealing with Air, Ventilation, Warming, Climatology and Food, are almost identical with those of the preceding edition of the work.

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* By J. Lane Notter, M.A., M.D.Dub., Professor of Hygiene in the Army Medical School, Netley, Colonel, Royal Army Medical Corps, &c.; and W. H. Horrocks, M.B., B.Sc.Lond., Assistant-Professor of Hygiene in the Army Medical School, Netley, Major, Royal Army Medical Corps. London. *J. & A. Churchill*, 1900. 1.085 pp. Price 25/-

The volume is an admirable one, and there is only one respect in which a suggestion may be offered for extending its value in a subsequent edition, and that is a respect in which almost all works on public health are deficient. Surely when communicable disease comes under consideration, the matter of what preventive measures are advocated and adopted is of prime importance in a reference work on public health. The treatment of this important branch of the subject is somewhat uneven in the present work, and is, generally speaking, insufficient; and this is so, notwithstanding the fact that some comparatively unimportant details of other subjects are treated with almost unnecessary fulness. This is a defect very easy of remedy at the competent hands of the authors of this volume, and doubtless an admirable work would thereby be made of even greater value than it is at present.

H. R. K.

SUBJECT INDEX TO TRANSACTIONS.

A Subject Index to the Transactions and Journal from the foundation of the Institute to the present year, 1876–1900, has been prepared.

The Volume will consist of about 200 pp. to range with the Journal, and contains detailed reference to the subject matter of the various papers recorded; it will be bound in cloth in the same style as the Transactions, and issued to Members and Associates of the Institute and others at a net cost of 2/-, including postage.

MEETINGS HELD

OCTOBER TO DECEMBER, 1900.

HOUSING OF THE WORKING CLASSES.

The resolutions which were passed at the Conference held by the Institute at the end of July, 1900, which were reported with the proceedings of the Conference in Part III. of the Journal, have been forwarded by the Council to the members of Her Majesty's Government with a communication expressing the hope that time will be found to bring forward in Parliament without delay a satisfactory measure of reform on the lines indicated in the resolutions of the Conference. A copy of this communication has been forwarded to the various Local Authorities who were represented at the Conference, and several of them are taking action in the matter by passing similar resolutions, or by calling the attention of Members of Parliament in the district to the importance of the subject.

HYGIENE IN EDUCATION.

With a view to securing more attention being given to the practice of hygiene in schools the Council have forwarded the following communication to the Education Department.

They have also commissioned a representative who is about to make a tour in the United States for the purpose of reporting to the Education Department and the West Riding County Council, to make a special report on the teaching and training in the subject of hygiene in schools in the United States of America.

2nd October, 1900.

To the Secretary of the Board of Education.

SIR,—Adverting to the letter from your Board, dated August 14th, suggesting that The Sanitary Institute should in the first instance submit in writing the points with regard to hygiene being more definitely included, both in training and practice, in the public elementary schools, the Council of the Institute desire to say that they are aware that "hygiene" has for a long time been named among the subjects in the Code; but it has been treated in a narrow and one-sided manner, and almost entirely as a text-book, instead of a life subject. This method of treating hygiene altogether fails to draw attention to the wide scope of the subject, and the important bearing it has on almost every department of life, especially of school life.

The Institute have urged upon the school world the value of hygiene in education, and have prepared a syllabus indicating the scope of the subject in relation to schools, and showing how other sciences are applied in the practice of hygiene. This syllabus also shows how almost every branch of a teacher's knowledge can be brought to bear upon the vital question of the laws of health. In order, however, that this wide view of the question may be brought under the notice of school managers and teachers, and made effective, it is necessary that the Education Department should in some way indicate that the teaching of the subject on a wider basis is needed.

In connection with this point, it is obvious that the teaching of the laws of health in schools will have little effect in training the scholar in the observance of these laws, unless they are observed and practised in the conduct of the school; and such training can only be accomplished where the teachers have themselves been trained by practical and experimental work, and understand how the laws of health enter into every department of school life, the mental as well as the physical, and that the subject is one that must be inculcated in the child by observation and experiment.

Hygiene fortunately is a subject that offers considerable facilities for experimental or object lesson teaching, as has already been pointed out by the Institute in the schedule to their memorial sent in to the Department on July 26th, 1899; and the Institute have under consideration the preparation of a series of articles to facilitate this method of teaching, somewhat on the lines of the Nature Study pamphlets now being issued by the Cornell University, State of New York.

To ensure that the teachers shall have the necessary training, it is essential that hygiene should be included in a definite and comprehensive manner in the curriculum of the training colleges; and the scheme propounded by the Vice-President of the Department for re-organising the training of teachers, so as to direct their energies towards specialising on certain subjects, would further the matter greatly by leaving room in the curriculum for the inclusion of this most important and urgent subject.

The teaching of chemistry and physics would be of much more value, educationally and practically, if a knowledge of the principles involved were conveyed by application, and no subject offers so wide a field, or more favourable opportunities for application of other sciences, than does hygiene.

The importance of the subject in school training has been emphasised by resolutions passed by societies and meetings within whose scope the subject comes, and some of these are appended. It may also be urged that a rudimentary knowledge of the laws that govern the spread of infectious diseases would tend to a better prevention of the spread of tuberculosis, and other diseases of this nature.

Some of the points which the Institute desire to urge may be summarised as follows:—

1. The term hygiene having been so used in the past as to lose its wide significance, it is desirable to find a more expressive title in order to lift the subject out of the technical groove into which it has run.

2. That an adequate place should be given to the subject in the training colleges, and a more comprehensive ground-work should be required for all teachers.

   It is suggested that the Examination arranged by The Sanitary Institute might be adopted as showing evidence of the "thorough knowledge of elementary hygiene and physiology," which is stated in the Instructions to Inspectors, par. 35, as necessary to teachers of household management. The Certificate of this Examination has already been accepted by the London School Board as equivalent to the South Kensington Hygiene Certificate. The Examination deals with the subjects of Hygiene and Physiology, especially from a teacher's point of view, and in their application to children in school life.

3. That hygiene should be given a recognised place in schools, by naming it in the code as a specified subject for both boys and girls of all ages, and by including with the code a special circular or appendix dealing with the subject.

   Training classes for teachers, leading to the examination of the Institute, have been established by the County Council of the West Riding of Yorkshire, and in other centres there is a desire to introduce practical hygiene into the schools.

4. That satisfactory methods of teaching and training should be set out for children of all ages.

   A scheme for this purpose was included in the memorandum forwarded to the Department by the Sanitary Institute, dated 26th July, 1899, and a revised copy of this scheme is being prepared.

These several points the Council have set out briefly, and they append short statements of special points to which the National Health Society, The Church Sanitary Association, and the National Association for the prevention of Tuberculosis, wish to draw attention. If the Department desire to have them amplified, the Institute, with the representatives of the other Societies, would be glad to attend and explain them more fully.

I am, Sir,
Your obedient Servant,
(Signed) E. White Wallis,
Secretary.

SESSIONAL MEETING.

A Meeting was held on December 12th, when a Discussion was opened on "Some Practical Aspects of the Plague at Sydney" (with illustrations), by Frank Tidswell, M.B., Ch.m., D.P.H., Principal Assistant Medical Officer of the Government of New South Wales. Mr. Shirley F. Murphy in the chair. The Paper and Discussion is printed in this number of the Journal, page 549.

LECTURES AND DEMONSTRATIONS TO SANITARY OFFICERS

The Thirtieth Course of Lectures and Practical Demonstrations and Visits of Inspection to places illustrative of Sanitary Practice and Administration, was held from September 17th to November 28th. 32 Students entered their names for the course.

EXAMINATIONS.

From October to December the following Examinations were held:—

PRACTICAL SANITARY SCIENCE.

Nov. 30th and Dec. 1st, London. 12 Candidates, 3 Certificates granted.

Dec. 14th and 15th, Manchester. 4 Candidates, 2 Certificates granted.

INSPECTORS OF NUISANCES UNDER THE PUBLIC HEALTH ACT, 1875.

November 9th and 10th, Newcastle-upon-Tyne. 29 Candidates, 22 Certificates granted.

Nov. 30th and Dec. 1st, London. 77 Candidates, 42 Certificates granted.

Dec. 14th and 15th, Manchester. 76 Candidates, 31 Certificates granted.

INSPECTORS OF MEAT AND OTHER FOODS.

Dec. 7th and 8th, London. 13 Candidates, 6 Certificates granted.

Practical Sanitary Science.

1900, Dec. 1.	ABBOTT, ALFRED ERNEST.
1900, Dec. 15.	ANDREW, JOSEPH SHIMELL.
1900, Dec. 15.	ARMSTRONG, JAMES G. D.
1900, Dec. 1.	BOSHER, VICTOR EVANS, A.R.I.B.A.
1900, Dec. 1.	BROMLY, ALAN.

Inspectors of Nuisances.

1900, Dec. 15.		Airey, Henry.
1900, Dec. 1.		Applegate, Charles James.
1900, Nov. 10.		Ayre, Thomas.
1900, Dec. 1.		Baker, Samuel Newsom.
1900, Dec. 1.		Baxter, Henry Thomas.
1900, Dec. 1.	*L*	Bevan, Miss Georgina Dacres.
1900, Nov. 10.		Blakemore, Richard.
1900, Dec. 1.		Body, George Edward.
1900, Dec. 15.		Bottomley, Gibson.
1900, Dec. 1.		Brittain, Frank.
1900, Nov. 10.		Broughton, Henry.
1900, Nov. 10.		Brow, John.
1900, Nov. 10.		Cape, John George.
1900, Dec. 15.		Cook, Arthur.
1900, Nov. 10.		Cordiner, William.
1900, Nov. 10.		Coulson, John Thomas.
1900, Dec. 1.	*L*	Cox, Miss Irene Winifred.
1900, Dec. 15.		Curtis, Walter.
1900, Dec. 15.	*L*	Dawson, Miss Edna.
1900, Dec. 15.		Diggle, Richard.
1900, Dec. 15.		Dodd, James.
1900, Dec. 15.		Dodd, William.
1900, Dec. 15.		Elliott, Stephen James.
1900, Nov. 10.		Fairweather, William McDonald.
1900, Dec. 15.		Fort, Alfred.
1900, Dec. 1.		Gee, Frederick George.
1900, Dec. 1.		Gilmour, David Archie.
1900, Dec. 1.	*L*	Gough, Miss Alice.
1900, Dec. 15.		Gourlay, Archibald.
1900, Dec. 15.		Grime, Tom.
1900, Dec. 15.		Hanson, Edward.
1900, Dec. 15.		Harrison, Joseph.
1900, Dec. 1.		Head, Thomas George.
1900, Dec. 15.		Hill, Rowland.
1900, Dec. 15.		Hindley, Thomas Henry.
1900, Dec. 15.		Hirst, Byron.
1900, Dec. 1.		Howie, William John.
1900, Nov. 10.		Hunter, James.
1900, Nov. 10.		Hunton, William.
1900, Dec. 1.		Jackman, Reginald Erasmus.
1900, Dec. 15.		Jessop, Sam Morton.
1900, Dec. 1.	*L*	Joseph, Miss Hilda.
1900, Dec. 1.		Kemp, Arthur Godfrey.
1900, Nov. 10.		Kirby, William Stobert.
1900, Dec. 1.		Kirkup, William.
1900, Dec. 15.		Knewstubb, Frederick William.
1900, Nov. 10.		Ladbrooke, John.

1900, Dec. 15.		Law, Frank Nicholson.
1900, Dec. 15.		Laws, George.
1900, Nov. 10.		Lawson, Frederick.
1900, Dec. 1.		Lemmoin-Cannon, Henry.
1900, Nov. 10.		Lewins, Joseph.
1900, Nov. 10.		Lewthwaite, George Rowell.
1900, Dec. 1.	*L*	Lyndon, Mrs. Charlotte.
1900, Dec. 15.		Manning, Edward.
1900, Dec. 1.		Mansfield, William Thomas.
1900, Dec. 1.		Marden, George.
1900, Dec. 1.	*L*	Marks, Miss Elizabeth Lane.
1900, Dec. 15.		Maxwell, John.
1900, Nov. 10.		Milburn, Joseph.
1900, Nov. 10.		Miller, William Fletcher.
1900, Dec. 15.		Milligan, William James.
1900, Dec. 1.		Mills, Bernard.
1900, Dec. 15.		Mills, John.
1900, Dec. 1.		Money, Francis George.
1900, Dec. 1.		Morgan, John.
1900, Dec. 1.		Nelson, George Trim.
1900, Dec. 1.		Parry, Edward.
1900, Dec. 15.		Parry, Owen Williams.
1900, Dec. 1.		Phillips, Robert.
1900, Dec. 1.		Plows, William Henry.
1900, Nov. 10.		Pritchard, Edmund.
1900, Dec. 1.		Pryer, Robert William Ambrose.
1900, Dec. 1.	*L*	Rabson, Miss Florence Margaret.
1900, Dec. 1.		Richards, Thomas M.
1900, Nov. 10.		Shanks, Richard Dalkin.
1900, Dec. 1.		Simpson, Henry Charles.
1900, Dec. 1.		Smith, Frank Hall.
1900, Dec. 1.		Smith, Tom.
1900, Dec. 15.		Sowerbutts, Frederick.
1900, Dec. 1.		Steel, Sydney Herbert.
1900, Dec. 1.		Stone, Henry W.
1900, Nov. 10.		Swaddle, Robert Jonathan.
1900, Dec. 1.		Tait, William Ironside.
1900, Dec. 15.		Thompson, Edmund.
1900, Dec. 15.		Tolson, Richard.
1900, Dec. 1.		Tomlinson, John.
1900, Nov. 10.		Turner, John.
1000, Dec. 1.		Walker, Albert Horace.
1900, Dec. 15.		Warburton, Henry.
1900, Nov. 10.		Whitfield, Ralph.
1900, Dec. 1.		Williams, Richard Ernest.
1900, Dec. 1.	*L*	Wells, Miss Harriet.
1900, Dec. 15.		Wright, Harry.
1900, Dec. 1.		Young, John Bishop.

Inspectors of Meat and Other Foods.

1900, Dec. 8. BAILEY, THOMAS WILLIAM.
1900, Dec. 8. JOHNSON, HENRY.
1900, Dec. 8. LONNON, JOHN IMRIE.
1900, Dec. 8. SIMPSON, HENRY GEORGE.
1900, Dec. 8. SIMPSON, PERCY JAMES.
1900, Dec. 8. TYLDESLEY, MARTIN.

Examination Questions.

Practical Sanitary Science.—London, November 30th and December 1st, 1900.

1. Describe the law of the diffusion of gases, and explain the importance of it in reference to ventilation.

2. If you could choose the site for a detached house, what soil, subsoil, and surroundings would you prefer, and why?

3. Explain the terms "shallow well," "deep well," "Artesian well." Discuss the suitability of waters derived from these for potable and manufacturing purposes.

4. Illustrate by sketches to scale and fully describe the materials and construction of

(1) A slated mansard roof, showing eaves and ridge;
(2) A concrete roof with a skylight in it.

5. Draw to a scale of 8ft. to one inch a plan and section of a school dormitory to hold twenty beds. Show the position of the beds, door, windows, inlets for fresh air, outlets for foul air, and state the cubic space required per bed.

6. Give rules for the size of windows in relation to the floor area or cubic contents of the rooms they serve.

7. State the advantages and disadvantages in the use of the following sanitary appliances: slop sink; grease trap; siphon interceptor; bell trap; long hopper pan; siphonic discharge pan; lead S trap.

8. Describe the best arrangement for storing ashes, garbage, and solid household refuse upon premises preparatory to its removal by the scavengers' carts, assuming the yard space provided to each dwelling house to be not less than 15ft. by 10ft. Give your views as to the removal and ultimate disposal of this refuse.

The Candidates were examined vivâ voce *on the 1st December.*

Practical Sanitary Science, Manchester, December 14th and 15th, 1900.

1. State the method of ascertaining the superficial area of regular polygons, and irregular polygons; and of the surfaces of cylinders, prisms, cones, spheres.

2. Describe with sketch the construction of a well in sandy soil, water being reached 30 feet from the surface. By what means can the water be raised to the ground level? Give details of the apparatus to be used.

3. Describe a method of softening a hard water derived from the chalk for use in a laundry.

4. Under what conditions are mechanical systems of ventilation desirable? Describe the plenum system of ventilation.

5. Describe the various methods of artificial lighting. Compare the merits and defects of each method.

6. How would you test a stoneware-pipe drain, jointed in cement, which is laid in a new building and connected with an 18-inch pipe sewer in a public road—

1st. As to the soundness of each pipe;
2nd. As to the soundness of each joint;

so as to determine whether the drain would be watertight or not in case of a stoppage near the sewer? Describe briefly the method of making the test, and the means and appliances you would use.

7. Describe a system of dealing with house and trade refuse in a town so as not to give rise to conditions prejudicial to public health.

8. Discuss the anaërobic method of sewage treatment, and state your views on its applicability and limitations.

The Candidates were examined vivâ voce *on the 15th.*

Inspector of Nuisances.—Newcastle-upon-Tyne,
November 9th and 10th, 1900.

1. Describe the relative functions of the Inspector of the Local Authority and H.M. Inspector of Factories in relation to factories and workshops.

2. Why is ventilation necessary, and what is the minimum cubic space, and floor space, for each adult person, which can be efficiently ventilated with unwarmed air, without a draught being caused? On what facts are your conclusions based?

3. Indicate the different persons who are empowered to take samples under the Sale of Food and Drugs Act, 1875. If the vendor, or his agent, decline the offer of the purchaser to divide the article purchased in his presence, what is the procedure to be observed?

4. What are the characteristics of good meat? What tests would you employ to assist you in deciding as to the wholesomeness or otherwise of a piece of beef?

5. Describe the internal arrangements of a model slaughter-house attached to a market or place where beasts are slaughtered in large numbers.

6. Describe the methods you would adopt for the disinfection of a room with a papered wall, a whitewashed ceiling, and a wooden floor, in which a case of small-pox has been nursed.

7. Explain how water may be polluted—(*a*) on gathering grounds; (*b*) in rivers: (*c*) in wells.

8. Give the reasons for providing anti-siphonage pipes, and give a sketch showing the arrangement of such pipes in connection with a tier of three W.C.s discharging into the same soil-pipe.

***The Candidates were examined* vivâ voce *on the* 10*th*.**

Inspector of Nuisances.—London, November 30th, and December 1st, 1900.

1. What are the duties of a Sanitary Inspector with respect to articles of food, such as meat, fish, milk, &c., which in his opinion are unfit for food.

2. What is "Margarine," as defined in the Margarine Act, 1887? Indicate the conditions under which it may be sold, and the procedure to be observed in purchasing a sample, under this Act.

3. What powers, under the Public Health Act, 1875, does a local authority possess, enabling its officers to test or examine a private house drain.

4. How does steam operate in the disinfection of infected clothing, bedding, and the like? Describe the mechanism of a steam disinfecting apparatus, and the method of using it. Define the terms "current steam" and "super-heated steam."

5. Describe the process of brickmaking. What is the nature of the nuisance frequently caused in the process.

6. What is the cubic capacity of a room 31ft. long, 21ft. 6in. wide, with a sloping roof 21ft. high at the ridge, and 12ft. high at the eaves? Make a sketch of the room, and give details of the calculations. If the room were used as a workshop, how many adults should be allowed to work in it?

7. State the advantages and disadvantages under different circumstances, and give sketches of: a mason's trap; a silt gully: a self-cleansing gully; a grease trap.

8. Sketch and explain in detail how a house drain should be laid, and the connections made to the soil pipe and to the public sewer.

The Candidates were examined vivâ voce *on December 1st.*

Inspector of Nuisances.—Manchester, December 14th & 15th, 1900.

1. What compulsory powers exist for the removal of an unwilling patient to an infectious diseases hospital?

2. What steps would you take with a view to abating a nuisance arising from (1) a blocked drain; (2) a drain discharging on a public road?

3. What appearances or conditions would guide you in condemning as unfit for food a consignment of tinned salmon? State how you would proceed, if called in, to examine such a consignment.

4. What is "margarine cheese," and what are the provisions regulating its sale under the Sale of Food and Drugs Act, 1899?

5. Describe how you would proceed to examine and determine whether a schoolroom is (*a*) overcrowded, (*b*) insufficiently lit, (*c*) badly ventilated.

6. How may pure water which is supplied through pipes from a storage reservoir become fouled in distribution?

7. What are the disadvantages attending the use of stoneware drain-pipes? How are these disadvantages met? Describe with sketches the joints mostly in use.

8. Describe the best methods of collecting excretal and house refuse in a part of a town where a water-closet system is not in use.

The Candidates were examined vivâ voce *on the* 15*th.*

Inspectors of Meat and other Food.—London, December 7th and 8th, 1900.

(*Only eight of the questions to be answered*).

1. What are the provisions of the Sale of Food and Drugs Act with regard to the purchase of samples for analysis?

2. What would lead you to suspect that an animal had died of Anthrax? If your suspicion were correct, what would be the respective duties of the police and the local sanitary officials?

3. Enumerate the diseases which, in your opinion, would render the flesh of animals unfit for human food, and indicate the parts of the carcase most frequently affected in each case.

4. In what circumstances would you condemn the flesh of cattle if the animals had suffered, during life, from Tuberculosis? What lead you to give this opinion?

5. What general symptoms would indicate that a cow standing in a market was suffering from (*a*) some acute illness or disturbance; (*b*) some chronic disease?

6. What parts or organs would you expect to find affected in an animal which had been slaughtered while suffering from (*a*) Actinomycosis; (*b*) Swine Fever; (*c*) Flukes? Under what circumstances would you condemn the meat of animals affected with such diseases?

7. What appearances would lead you to suspect that certain parts of a carcase had been removed for the purpose of concealing disease? What steps would you take if you found such parts of a carcase exposed for sale?

8. What are the chief points of difference between the dressed carcase of a heifer, an old cow, a bullock, and a bull; and between the fat, heart, liver, and tongue of an ox and those of a horse?

9. Describe the tuberculin test and the method in which it is applied.

10. What are the points to be attended to in the management of a slaughter-house and the removal and disposal of offal and refuse?

The Candidates were examined vivâ voce *on the* 8*th.*

COURSE OF TRAINING IN PRACTICAL HYGIENE.

The Institute have co-operated with Bedford College in arranging a Course of Training in Practical Hygiene for Teachers.

THE LECTURES WILL BE GIVEN AT

BEDFORD COLLEGE, YORK PLACE, BAKER STREET, W.

AND AT THE

SANITARY INSTITUTE, 72, MARGARET STREET, W.

The course will consist of thirty lectures, given on Saturday mornings throughout the three terms of the year 1901, and will be held partly at Bedford College for Women and partly at the Sanitary Institute: it will include practical demonstrations, and visits to schools and places where the application of hygiene in practice may be seen. The various subjects—Sanitation of Schools, Physiology for Teachers, Psychological Attitude of Mind towards the Study of Childhood, will be dealt with by well-known authorities, and will be illustrated by experiments, diagrams, drawings, models, and lantern slides. Opportunities will be given to students to obtain practical acquaintance with the various subjects dealt with, in the Laboratories of Bedford College, and for practical demonstration of Sanitary Appliances in the Parkes Museum.

The course affords a preparation which the Sanitary Institute regards as suitable for the examination held by them for their Certificate in Practical Hygiene for School Teachers. Full particulars of this examination can be obtained on application to the Secretary of the Sanitary Institute.

The course is open to women students over 19 years of age who hold either a Teacher's Diploma or Certificate, or have had at least two years' experience in teaching in a secondary school, or who can produce satisfactory evidence that they will be able to benefit by the instruction afforded them.

The Libraries of Bedford College and of the Sanitary Institute, and also the Parkes Museum of Sanitary Appliances, will be open free during the three terms to students attending the course.

The fee is £5 5s. for the course, or

2 Guineas for the Lent Term,
1½ " " Easter Term,
2½ " " Michaelmas Term.

SYLLABUS OF LECTURES.

LENT TERM.

10 LECTURES ON PHYSIOLOGY AND ALLIED SCIENCES,
TO BE GIVEN AT BEDFORD COLLEGE,
BEGINNING SATURDAY, JANUARY 19TH, AT 11 A.M.

Lecturer: J. S. EDKINS, M.A., M.B.

The General Structure and arrangement of the Body; the Coagulation of the Blood, the Structure and Chemical Composition of the Blood, the Structure of Muscle; the Changes involved in Muscular Contraction; the Circulation of the Blood; the Structure of the Blood Vessels; the Heart, its arrangement and mode of working the Movements of Respiration; the Changes in the Air and in the Blood resulting from Respiration; the Classification of Foods; the Structure of the Organs of Digestion, and their mode of working the Changes produced in the Processes of Digestion; the Paths of Absorption of Digested Foods; the Structure and Function of the Kidney; the Structure and Function of the Skin, the Nature of Metabolism, and the Regulation of the Heat of the Body; the general Structure of the Nervous system and its more important Functions; the general Structure and mode of working of the Organs of the Senses.

EASTER TERM.

7 LECTURES ON CONSTRUCTION AND PRACTICAL SANITATION OF SCHOOLS
TO BE GIVEN AT THE SANITARY INSTITUTE,
BEGINNING SATURDAY, MAY 4TH, AT 10 A.M.

Lecturer: HENRY R. KENWOOD, M.B., D.P.H.

General.

Individual and social hygiene as far as regards school life, including the necessary municipal and legal sanitation; site of private dwellings or schools; effect of neighbourhood, of sea, or large sheets of water; effect of vegetation; soil in town and country; natural drainage of subsoil; artificial drainage of subsoil; local elevation; aspect with reference to sun and winds.

Water Supply and Distribution.

Wells, causes of pollution and means for their prevention; constant and intermittent systems; cisterns, material and construction; position and cleansing, separate cistern supplies for closets; domestic filtration of water; distribution of water in schools and public buildings; provision for cleansing drinking vessels.

Furnishing.

Seats and desks, slopes, adjustments; teacher's platform; books and printing; colour of walls.

Lecturer: J. OSBORNE SMITH, F.R.I.B.A.

Planning of Houses.

Dwelling and sleeping apartments, kitchen, offices, &c.

Planning of Schools.

Arrangement of assembly-room and gallery, class-rooms, studio, music rooms, gymnasium, and of cloak-rooms, lavatories, water-closets; structure of walls and floors for class-rooms, lavatories, &c.; playgrounds; requirements of Education Department.

Lavatories, &c.

Simplest effective fittings for basins and supply and waste pipes, and their discharge in open air; open channels, traps, &c.; arrangements of school lavatories.

Water-closets.

Good and bad types: position in building; walls, floors, ventilation, waste preventers, pans and traps, connection with soil pipe, ventilation of traps; soil pipes, position, size, material, ventilation; drains, position outside building, size, material, inclination, ventilation—methods of testing; manholes, ashpits, and dustbins; the law as to the collection and disposal of dust and refuse.

Warming.

Of halls and corridors, lavatories, class-rooms, &c.; by stoves, hot water, hot air, open fireplaces; effect of radiant heat on atmosphere and health; position of open fireplaces in class-rooms; time occupied in warming a room including the walls and furniture; fire screens and guards.

Lighting.

Natural: position and size of windows, with regard to ceiling and floor: how light should fall on occupants of a room; artificial; purposes to be considered, method, arrangement of lights, shading, pavement lights for passages, &c.

Ventilating.

Quality of air; amount required; floor space and cubic space required renovation of air; organic impurities; ventilation of buildings, of class-rooms occupied, of corners where air stagnates; mechanical ventilation, propulsion, and extraction; consideration of the daily use of the different parts of the building; a practical demonstration will be given at a school building

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MICHAELMAS TERM.

5 LECTURES ON EDUCATION,
TO BE GIVEN AT BEDFORD COLLEGE,
BEGINNING SATURDAY, OCTOBER 5TH, AT 10 A.M.

Lecturer: MISS H. ROBERTSON, B.A.

HYGIENE IN EDUCATION.

Healthy Mental Life and Its Physical Conditions.

(*a*) Efficiency of the Nervous system as determined by sufficiency and quality of Blood Supply. Connection of this with air, exercise, and nourishment.

(b) Efficiency of Special Sense Organs as determined by congenital peculiarities, exercise, and surroundings.

Detailed consideration of these Conditions of Healthy Mental Development at different stages of growth.

i. During first three years of life.
ii. During kindergarten stage.
iii. During subsequent stage of school life.

Special opportunities of development afforded by circumstances of each stage, and special attendant dangers.

LECTURES ON INFECTIOUS DISEASES AND DISINFECTION,

TO BE GIVEN AT BEDFORD COLLEGE,

BEGINNING SATURDAY, OCTOBER 5TH, AT 11 A.M.

Lecturer: W. C. C. PAKES, D.P.H.Camb., F.C.S.

LECTURE 1.—General Diseases and Conditions incidental to school life; their causes and effects.
" 2.—Infectious Diseases: their nature and history, and means of prevention. Tuberculosis, Diphtheria, Scarlet Fever.
" 3.—Infectious Diseases—Chicken Pox, Measles, Whooping Cough, Mumps, Ophthalmia, Small Pox, &c.
" 4.—Law and procedure relating to Infectious Diseases.
" 5.—School Accidents.
" 6.—Demonstration at Bedford College upon School Accidents.
" 7.—Disinfectants and Disinfection.
" 8.—Demonstration upon Disinfection.

FORTHCOMING MEETINGS.

CALENDAR, JANUARY TO APRIL, 1901.

As far as at present arranged.

Council Meetings are held Monthly on the Second Wednesday in each Month at 5 p.m., except August and September.*

Special Purposes Committee	Third Monday at 5 p.m.
Finance Committee	Second Wednesday at 4.30 p.m.*
Exhibition Committee	First Monday at 5 p.m.
Congress and Editing Committee	Second Monday at 5 p.m.
Museum and Library Committee	Fourth Monday at 5 p.m. (except December).
Examination Committee	Fourth Thursday in Jan., 5 p.m.
Parliamentary Committee	As occasion requires.
Rivers Pollution Committee	
Meat Inspectors Exam. Committee	

* *The Council Meeting and Finance Committee in April will be on the third Wednesday.*

The Parkes Museum is open free, on Mondays 10 a.m. to 8 p.m., other days 10 a.m. to 6 p.m. The Library is closed at 2 p.m. on Saturday.

JANUARY.

12 S. } Sydney Examination in Practical Sanitary Science and for Inspectors
19 S. } of Nuisances.

19 S. Course of Training in Practical Hygiene for School Teachers commences. Ten Lectures on Physiology and Allied Sciences to be given on Saturday mornings, at 11 a.m., at Bedford College, by J. S. Edkins, M.A., M.B.

25 F. } Examination in Practical Sanitary Science and for Inspectors of
26 S. } Nuisances, Bristol.

26 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

FEBRUARY.

1 F. Lecture to Sanitary Officers at 7 p.m. Mechanical Physics; Laws of Motion, Hydraulics, &c., by E. J. Steegmann, M.B., D.P.H.

2 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

4 M. Lecture to Sanitary Officers at 7 p.m. Natural Forces; Light, Heat, Electricity; Chemistry, by E. J. Steegmann, M.B., D.P.H.

6 W. Lecture to Sanitary Officers at 7 p.m. The Atmosphere; Pressure and Composition; Air; Combustion and Respiration, by E. J. Steegmann, M.B., D.P.H.

8 F. Lecture to Sanitary Officers at 7 p.m. Meteorology, by W. Marriott, F.R.MET.SOC.

8 F. } Examination in Practical Hygiene for School Teachers, London.
9 S. }

9 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

12 Tu. Lecture to Sanitary Officers at 7 p.m. Sanitary Law, A: Introductory Remarks, Public Health Acts—English, Scotch, Irish; other Statutes relating to Public Health; By-Laws (Models, etc.), Regulations, Orders, Memoranda, etc., by J. Priestley, B.A., M.D., M.R.C.S., D.P.H. Medical Officer of Health, Lambeth.

The Syllabus of the Lectures to School Teachers is given on p. 655.

13 W. Inspection and Demonstration, Lambeth Disinfecting Station, Wanless Road, S.E., 3 p.m.

13 W. **Sessional Meeting.** Discussion on the state of our Streets, opened by T. Blashill, F.R.I.B.A.

14 Th. Lecture to Sanitary Officers at 7 p.m. Sanitary Law, B: Public Health London Act; Metropolis Local Management Acts; By-Laws and Regulations in Force in the Administrative County of London, by J. Priestley, B.A.,M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

15 F. Lecture to Sanitary Officers at 7 p.m. Sanitary Law, C: Factory and Workshop Acts (including Bakehouse Legislation) 1878–95, as they affect the Sanitary Inspector; Smoke Legislation, Food and Drugs Act, 1899, by J. Priestley, B.A.,M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

16 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

18 M. Lecture to Sanitary Officers at 7 p.m. Duties of a Sanitary Inspector —General, A: Outdoor, by J. Priestley, B.A., M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

20 W. Inspection and Demonstration in the District of St. George's, Hanover Square, at 2 p.m. (number limited), conducted by Albert Taylor, Chief Sanitary Inspector.

20 W. Lecture to Sanitary Officers at 7 p.m. Duties of a Sanitary Inspector —General, B: Indoor, by J. Priestley, B.A.,M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

22 F. Lecture to Sanitary Officers at 7 p.m. Duties of a Sanitary Inspector —C: Offensive Trades and Trade Nuisances, &c., by J. Priestley, B.A., M.D., M.R.C.S., D.P.H., Medical Officer of Health, Lambeth.

23 S. Inspection and Demonstration at the Friern Barnet Sewage Works, at about 3 p.m., conducted by E. J. Reynolds, AM.I.C.E., Surveyor to U.D. Council.

23 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

25 M. Lecture to Sanitary Officers at 7 p.m. Infectious Diseases, by Henry R. Kenwood, M.B., D.P.H., F.C.S., Asst. Professor of Hygiene, University College, Med. Officer of Health, Stoke Newington.

27 W. Inspection and Demonstration at Common Lodging House.

27 W. Lecture to Sanitary Officers at 7 p.m. Methods of Disinfection, by Henry R. Kenwood, M.B., D.P.H., F.C.S.

MARCH.

1 F. Lecture to Sanitary Officers at 7 p.m. Water: Composition, Pollution, and Purification, by Henry R. Kenwood, M.B., D.P.H., F.C.S.

2 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

2 S. Inspection and Demonstration at Islington Disinfecting Station, 3 p.m., conducted by A. E. Harris, L.R.C.P., L.R.C.S., M.O.H.

4 M. Lecture to Sanitary Officers at 7 p.m. Elementary Statistics, by Henry R. Kenwood, M.B., D.P.H., F.C.S.

5 Tu. Lecture to Sanitary Officers at 7 p.m. Details of Plumbers' Work. by J. Wright Clarke.

6 W. Inspection and Demonstration at Soap Works.

6 W. Lecture to Sanitary Officers at 7 p.m. Building Materials, by Prof. R. Elsey Smith, A.R.I.B.A.

8 F. Lecture to Sanitary Officers at 7 p.m. Sanitary Building Construction and Planning; Soil and Local Physical Conditions, by Prof. T. Roger Smith, F.R.I.B.A.

8 F.⎫ Examinations in Practical Sanitary Science and for Inspectors of
9 S.⎭ Nuisances, Edinburgh.

9 S. Inspection and Demonstration at Beddington Sewage Farm, at 3 p.m., conducted by T. Walker, Borough Engineer and Surveyor, Croydon.

9 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

11 M. Lecture to Sanitary Officers at 7 p.m. Ventilation, Lighting, and Warming, by W. C. Tyndale, M.INST.C.E.

12 Tu. Lecture to Sanitary Officers at 7 p.m. Calculations, Measurements, and Plans and Sections, by W. C. Tyndale, M.INST.C.E.

13 W. **Sessional Meeting,** at 8 p.m. Discussion on Ventilation: success and failures of the methods at present in use, by Christopher Childs, M.A., M.D., D.P.H.

15 F. Lecture to Sanitary Officers at 7 p.m. Sanitary Appliances, by W. C. Tyndale, M.INST.C.E.

16 S. Inspection and Demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m., conducted by Charles Jones, M.INST.C.E., Engineer and Surveyor to the District Council.

16 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

18 M. Lecture to Sanitary Officers at 7 p.m. House Drainage, by W. C. Tyndale, M.INST.C.E.

19 Tu. Lecture to Sanitary Officers at 7 p.m. Water Supply, Sources of Supply and Distribution, by Prof. Henry Robinson, M.INST.C.E.

20 W. Inspection and Demonstration in the District of St. George's, Hanover Square, at 2 p.m. (number limited), conducted by Albert Taylor, Chief Sanitary Inspector.

20 W. **Ordinary General Meeting.**

21 Th. Lecture to Sanitary Officers at 7 p.m. Sewerage, by Prof. Henry Robinson, M.INST.C.E.

22 F.}
23 S.} Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Birmingham.

23 S. Lecture to School Teachers, Bedford College. See Jan. 19th.

23 S. Inspection and Demonstration at the Sewage Works, Sutton, Surrey, conducted by C. Chambers Smith, Town Surveyor, at 3 p.m.

25 M. Demonstration of Book-keeping as carried out in a Sanitary Inspector's Office, in the Parkes Museum, at 7 p.m., by Albert Taylor, Chief Sanitary Inspector, District of St. George's, Hanover Square.

26 Tu. Lecture to Sanitary Officers at 7 p.m. Sewage Disposal, by Prof. Henry Robinson, M.INST.C.E.

27 W. Inspection and Demonstration at East London Water Works, Lea Bridge, at 3 p.m., conducted by W. B. Bryan, M.INST.C.E.

28 Th. Lecture to Sanitary Officers at 7 p.m. Scavenging. Disposal of House Refuse, by Prof. Henry Robinson, M.INST.C.E.

29 F. Lecture to Sanitary Officers at 7 p.m. Signs of Health and Disease in Animals destined for Food, when alive and after slaughter; Tuberculin and other Tests, by W. Hunting, F.R.C.V.S.

29 F.}
30 S.} Examination for Inspectors of Meat and other Foods, Birmingham.

30 S. Inspection and Demonstration at L.C.C. Sewage Disposal Works, Barking, at 3 p.m., conducted by Jno. Ed. Worth, District Engineer.

APRIL.

1 M. Lecture to Sanitary Officers at 7 p.m. The Names and Situations of the Organs of the Body in Animals, by W. Hunting, F.R.C.V.S.

3 W. Lecture to Sanitary Officers at 7 p.m. Practical Methods of Stalling and Slaughtering Animals, by W. Hunting, F.R.C.V.S.

5 F. **Good Friday.** Museum closed.

8 M. BANK HOLIDAY. Museum closed.

17 W. **Sessional Meeting**, at 8 p.m. Discussion on Sewage Purification and Standards of Purity, opened by Drs. H. R. Kenwood and W. Butler.

15 M. Inspection and Demonstration at the Metropolitan Cattle Market, York Road, N., at 3 p.m., conducted by James King, M.R.C.V.S., Veterinary Inspector, Metropolitan Cattle Market.

15 M. Lecture to Sanitary Officers at 7 p.m. The Appearance and Character of Fresh Meat, Organs, Fat, Blood, Fish, Poultry, Milk, Fruit, Vegetables, and other food, and the conditions rendering them, or preparation of them, fit or unfit for human consumption, Preserving and Storing Meat and other Foods, by F. Petronell Manby, B.A., M.D., D.P.H., Medical Inspector, Local Government Board.

17 W. Lecture to Sanitary Officers at 7 p.m. The Hygiene of Byres, Lairs, Cow Sheds, and Slaughter Houses, and all places where animals destined for the supply of food are kept, and the Hygiene of Markets, Dairies, and other places where food is stored, prepared, or exposed for sale, and transported, by E. Petronell Manby, B.A., M.D., D.P.H., Medical Inspector, Local Government Board.

18 Th. Lecture to Sanitary Officers at 7 p.m. Diseased Meat, with a Demonstration of Morbid Specimens collected from Meat Markets, by James King, M.R.C.V.S., Veterinary Inspector, Metropolitan Cattle Market.

20 S. Inspection and Demonstration at Knackers' Yard.

22 M. Lecture to Sanitary Officers at 7 p.m. The Laws, By-Laws, and Regulations affecting the Inspection and Sale of Meat and other articles of food, including their preparation and adulteration, by E. Petronell Manby, B.A., M.D., D.P.H.

26 F.}
27 S.} Examinations in Practical Sanitary Science and for Inspectors of Nuisances, London.

HON. FELLOWS, FELLOWS, MEMBERS, AND ASSOCIATES ELECTED.

OCTOBER TO DECEMBER, 1900.

(A complete list can be had on application.)

HON. FELLOWS.

Reg. No.	Date of Election.	
46	1900. Nov.	GRÉHANT, Professor, 90, *Coura de Vincennea, Paris.*
48	1900. Dec.	KÖHLER, Dr., *Wirklicher, Geheimer Ober-Regierwegsrath, Kaiserliches Gesundherhaut, Berlin.*
47	1900. Dec.	MEYER, Herr F. Andreas, *Chief Engineer, Baudeputation, Hamburg.*

FELLOWS.

676	1900. Dec.	FIRTH, Prof. Robert Hammill, F.R.C.S., D.P.H., *Netley, Hants.*
434	1900. Dec.	TAYLOR, William Frederick, M.D., M.R.C.S., L.S.A., D.P.H., *Brisbane, Queensland.*

MEMBERS.

Reg. No.	Date of Election.	
1441	1900. Nov.	‡Bains, George Skipsey Liddle, *Surveyor and Sanitary Inspector, Urban District Council Offices, Saltburn-by-the-Sea.*
1458	1900. Dec.	Bennett, Gerald Winzar, ASSOC.M.INST.C.E., 107, *Norroy Road, Putney, S.W.*
1442	1900. Nov.	Bowles, Augustus Robert, ASSOC.M.INST.C.E., *The Parade, Sandgate.*
1428	1900. Oct.	Bunting, Thomas Frederick, *Borough Surveyor, Maidstone.*
1459	1900, Dec.	*‡Chapman, Matthew, 11, *Maude Street, Grimsby.*
1443	1900. Nov.	‡Clarke, Robert, *Engineer and Surveyor, Urban District Council, Dawlish.*
1460	1900. Dec.	Clucas, Robert Hampton, *Borough Engineer, Kendal, Westmoreland.*
1429	1900. Oct.	Frost, Herbert, *Surveyor, U.D.C., Gosport, Hants.*
1444	1900. Nov.	*Greenwood, James, *Pike View, Bolton Road, Chorley, Lancs.*
1430	1900. Oct.	‡Gregson, George, *Eastwood, Western Hill, Durham.*
1447	1900. Nov.	Grieves, William Hedley, *Town Surveyor and Waterworks Engineer, Buxton.*
1431	1900. Oct.	Harman, Edward Alfred, M.INST.C.E., *Chief and Manager, Gas Works, Huddersfield.*
1448	1900. Nov.	Hepper, John, F.S.I., F.A.I., J.P., *East Parade, Leeds.*
1449	1900. Nov.	*Holmes, Reuben, 2, *Armstrong Street, Oldham.*
1445	1900. Nov.	*S*‡Holmes, Miss Rose Beatrice Wyman, 4, *Croftdown Road, Highgate Road, N.W.*
1432	1900. Oct.	Houghton, T. Marcus, F.S.I., 14, *Sherborne Lane, E.C.*
1446	1900. Nov.	*M*‡Hugall, Tom Newton, *Chief Inspector of Dairies and Markets, Shanghai, China.*
1433	1900. Oct.	Humphries, Herbert H., *Engineer and Surveyor, U.D.C., Public Hall, Erdington.*
1450	1900. Nov.	Irving, W. Edmund, *Shire Engineer, Toowong, Brisbane, Queensland.*
1434	1900. Oct.	Jameson, Matthew Wm., 15, *Great Alie Street, Whitechapel, E.*
1435	1900. Oct.	Johnston, Wyatt, M.D., 76, *St. Gabriel Street, Montreal, Canada.*
1461	1900. Dec.	*s* Jowett, Miss Henrietta F., 46, *Aireville Road, Frizinghall Road, Bradford.*
1451	1900. Nov.	*Leigh, Arthur Graham, *Chorcliff, Chorley.*
1462	1900. Dec.	Macleod, Herbert William George, M.D., M.S., D.P.H., *The Turret, Streatham, S.W.*
1463	1900. Dec.	Maybury, Henry Percy, *Council House, Malvern.*
1452	1900. Nov.	Moore, Henry Cecil, M.R.C.S., L.S.A., M.O.H., late R.E., 26, *Broad Street, Hereford.*

Reg. No.	Date of Election,	
1437	1900. Oct.	Nuttall, William, *Engineer and Surveyor, U.D.C., Prestwich.*
1464	1900. Dec.	O'Neill, Charles, M.D., D.P.H., M.O.H., 39, *Gt. Victoria Street, Belfast.*
1453	1900. Nov.	Parr, Frank, ASSOC.M.INST.C.E., *Borough Surveyor and Sanitary Inspector, Bridgwater.*
1454	1900. Nov.	*Pickin, W. H., *Fletton Spring, Peterborough.*
1438	1900. Oct.	Pym-Jones, Inigo, *Borough Surveyor and Sanitary Inspector, Lymington.*
1465	1900. Dec.	Riley, John, *Avondale House, Orchard Road, Erdington, Birmingham.*
1466	1900. Dec.	M ‡Saunders, Rowland Glave, M.R.C.V.S., *Rosevean House, Penzance.*
1467	1900 Dec.	M Simpson, Henry George, M.R.C.V.S., *Gordon House Windsor.*
1439	1900. Oct.	‡Stevenson, John, *Eckington House, East Molesey.*
1455	1900 Nov.	Swales, Thomas Russell, *Assistant Borough Engineer and Surveyor, Worthing.*
1468	1900. Dec.	Tidswell, Frank, M.B., C.M., D.P.H., *Sydney, N.S.W., Australia.*
1440	1900. Oct.	Warlow, William Richmond, *Nolon House, Brentford.*
1456	1900. Nov.	*Wilkinson, Frank, *Peel House, Shawforth, Rochdale.*
1438	1900. Oct.	*‡Wilson, Marmaduke Temple, 69, *Narrowgate Street, Alnwick.*
1437	1900. Nov.	‡Wootton, Allen Shakespeare, *Borough Surveyor, South Molton.*

ASSOCIATES.

2147	1900. Nov.	‡Ablett, Joseph H., *Bloomfield, Goldsworth, Woking.*
2148	1900. Nov.	‡Ackrel, William, 24, *Webster Street, Bradford.*
2149	1900. Nov.	‡Allen, James, 7, *Granville Street, Newington, Hull.*
2150	1900. Nov.	‡Anderson, Charles, 31, *Dorset Street, Sheffield.*
2165	1900. Nov.	‡Baxter, Hugh Steven, 253, *Capworth Street, Leyton.*
2193	1900. Dec.	M Baxter, James Anderson, 3, *Market Street, Dundee.*
2151	1900. Nov.	‡Beard, Walter, 23, *Causeway Head, Sowerby Bridge.*
2166	1900. Nov.	‡Beaty, George, 12, *Hill Street, Willington Quay.*
2194	1900. Dec.	‡Bobbitt, A. J., 6, *Elmcroft Street, Clapton, N.E.*
2167	1900. Nov.	‡Cartwright, William, *Little Sutton, Chester.*
2168	1900. Nov.	‡Clarke, Albert Charles John, 7, *Manilla Crescent, Weston-Super-Mare.*
2152	1900. Nov.	‡Davies, Richard Jeffreys, *Reservoir House, Treharris.*

Reg. No.	Date of Election	
2169	1900. Nov.	‡Davis, Richard James, 33, *Wellington Square, Chelsea.*
2195	1900. Dec.	‡Donnewald, Victor Edward Francis, 49, *Adays Road, E. Dulwich.*
2153	1900. Nov.	‡Dowds, Thomas McGlary, *Annetyard, Skelmorlie, N.B.*
2170	1900. Nov.	‡Driver, Harry Mitchell, *Princes Street, Woodlesford, Leeds.*
2154	1900. Nov.	‡Foster, Leonard, "*The Knoll,*" *Ampthill.*
2155	1900. Nov.	Gamble, Miss Edith Gompertz, 30, *Knollys Road, Streatham, S.W.*
2196	1900. Dec.	‡Groves, Esau Henry, 150, *Fenchurch Street, E.C.*
2171	1900. Nov.	‡Haigh, Tom Vickerman, *Wellfield Cottage, Netherton, Huddersfield.*
2156	1900. Nov.	‡Hampton, David William, 153, *Whit Lane, Pendleton, Manchester.*
2172	1900. Nov.	‡Henderson, William L., *Clashmugach, Ardgay, N.B.*
2157	1900. Nov.	‡Hook, Caleb, *York Place, Scarborough.*
2199	1900. Dec.	*M* Hoey, William, *City Abattoir, Belfast.*
2198	1900. Dec.	‡Howse, William Thomas, *Homerdale, Erith Road, Bexley Heath.*
2142	1900. Oct.	‡Hutchinson, Edward Hall, 37, *Arthur Street, Edinburgh.*
2143	1900. Oct.	‡Johnson, Mrs. Harriette Annie, 16, *Buckingham Mount, Headingley, Leeds.*
2144	1900. Oct.	‡Jones, Wentworth, 20, *Hawkins Street, Camp Road, Leeds.*
2197	1900. Dec.	‡Kershaw, William George, 50, *Fitzroy Road, N.W.*
2173	1900. Nov.	‡Kilner, Edward, 74, *Longwood Road, Huddersfield.*
2174	1900. Nov.	‡Lake, Richard, *Castle House, Sidmouth.*
2175	1900. Nov.	‡Lewis, Benjamin, *Islwyn Cottage, Newbridge, Newport, Mon.*
2176	1900. Nov.	‡Lindsay, James Moir, *Castle Street, Seedley Road, Pendleton, Manchester.*
2178	1900. Nov.	‡March, Thomas William, 48, *Russell Road, Wimbledon.*
2179	1900. Nov.	‡Martin, Harry, 18, *St. Patrick's Terrace, Union Road, Leytonstone.*
2177	1900. Nov.	‡McKenn, Robert John, 3, *Cliff Avenue, The Cliff, Lower Broughton, Salford, Manchester.*
2158	1900. Nov.	*M*‡Newby, John, 12, *Stannington Avenue, Heaton, Newcastle-upon-Tyne.*
2159	1900. Nov.	‡Palmer, Joseph Buckley, Junr., 62, *Wellington Road, Oldham.*
2160	1900. Nov.	‡Powell, William James, 6, *Queen Street, Cardiff.*
2145	1900. Oct.	‡Raine, John Edward, *Seaham Rectory, Seaham.*
2146	1900. Oct.	‡Raistrick, Harry, *Fitzroy Road, Bradford.*

Reg. No.	Date of Election	
2180	1900. Nov.	‡Rivett, Charles, 1, *St. George's Terrace, Roker, Sunderland.*
2181	1900. Nov.	‡Roberts, Mortimer Nicholas Haly, *Aldridge, Stafford.*
2182	1900. Nov.	‡Rodley, Arthur, 110, *Alexandra Road, Heeley, Sheffield.*
2183	1900. Nov.	‡Rowsell, William, *Stoke Street, Gregory, Taunton.*
2184	1900. Nov.	‡Sands, Percy Brett, 19, *Warwick Gardens, Kensington, W.*
2185	1900. Nov.	‡Savery, Frederick, 26, *Redland Park, Redland, Bristol.*
2186	1900. Nov.	‡Smith, George, *Royal Southern Hospital, Liverpool.*
2161	1900. Nov.	‡Smith, John Murchie, 19, *Highland Cottages, Wallington, Surrey.*
2162	1900. Nov.	‡Stewart, Donald Alexander, *Banavie, Inverness.*
2187	1900. Nov.	‡Sunderland, Charlie Harker, 220, *Sherborne Road, Yeovil.*
2163	1900. Nov.	‡Swanson, Thomas Watson, 20, *Brunton Place, Edinburgh.*
2188	1900. Nov.	‡Taverner, George Frederick, 39, *Haggard Road, Twickenham.*
2189	1900. Nov.	‡Tiplady, Samuel, 19, *Buckley Street, Green Road, Leeds.*
2164	1900. Nov.	‡Wansbrough, Cecil Shartman, *King's College, Strand, W.C.*
2200	1900. Dec.	‡Wharton, Herbert, 468, *Oldham Road, Failsworth.*
2190	1900. Nov.	‡Wilkinson, Harry Fellowes, *Fulford House, The Crescent, S. Tottenham.*
2191	1900. Nov.	‡Williams, Philip, 59, *Shaftesbury Avenue, Montpelier, Bristol.*
2192	1900. Nov.	‡Wright, Walter, *Park Villa, Yeovil.*

OBITUARY.

SIR HENRY ACLAND, BART., K.C.B., M.D., F.R.S.

Hon. Physician to H.R.H. The Prince of Wales.

(VICE-PRESIDENT).

In Sir Henry Acland, Oxford has lost one of her best known sons; a man of high character, and of remarkable earnestness of purpose. For many years Regius Professor of Medicine in the University, and the man to whom Oxford is indebted more than to any other for the promotion of her Natural Science

School, by the establishment of the "New Museum." In "Reminiscences of Oxford," by the Rev. W. Tuckwell, issued last year, this fact is thus referred to: "The proposal (to establish a Natural Science Museum) was vehemently denounced; by economists on the ground of cost, by the old fashioned classicists as intrusive, by theologians as subtly ministering to false doctrine, heresy and schism. . . . . Backed by Daubenry and Buckland, as later by Dean Liddell and Professor Phillips, Dr. Acland sedulously pressed it, till early in the fifties the money was voted, the design adopted, the first stone laid by Lord Derby, and the work begun—due, as ought always to be remembered, to the initiative and persistence of Acland more than of any other man." In spite, however, of the fact that he was Professor of Medicine he never encouraged purely medical studies in Oxford, holding the view that the student should do the preliminary scientific work there, and then go to some London medical school for the rest of his education.

Sir Henry was intensely interested in sanitary work, and was appointed a member of the Royal Sanitary Commission as long ago as in 1869; he also presided over the Public Health Section of the Social Science Association at one of its Congresses. He wrote a "Memoir on the Visitation of Cholera in Oxford in 1884," and a small treatise on Village Health, and also gave an account of the state of public health matters in Egypt, after a visit to that country in 1885–6, in the form of a contribution to *The Times.*

He took a considerable interest in the work of the Sanitary Institute, especially in its examinations for sanitary inspectors, and he had some idea of getting a similar examination started in Oxford; he was also much interested in the establishment of the Institute of Preventive Medicine, now the Jenner Institute.

Personally Sir Henry Acland was urbanity and kindness itself, and several generations of Oxford men now living bear testimony to his never-failing courtesy, and to the encouragement and sound advice they received from him.

W. H. C.

EXHIBITS ADDED TO THE MUSEUM,

JUNE TO DECEMBER, 1900.

Mortality and Occupations. Tabular diagram showing the relative rates of mortality in various professions and occupations.

Life Tables. Diagram showing expectation of life at various ages.

Filtration of Water. Diagram giving comparative results of water passed through various forms of filter, the figures being taken from a series of experiments conducted by Prof. G. S. Woodhead and Dr. G. E. Wood, under the auspices of the Royal College of Surgeons.

Drains and Sewers. Diagram representing defective and obsolete forms of construction.

Trap and Soil-pipe Connections. Diagram illustrating defective methods of construction.

Filter. "Mallie" in metallic case, with tap for fitting to water supply. *Lotz, Abbott & Co.*

Ventilation. A section of air chamber, with inlet for fresh air, fitted with typical forms of ventilators, so as to illustrate their action. *Purchased.*

Water Pollution. Model, fitted in working order, illustrating the suction produced around a damaged water-supply pipe when the water is passing along it at pressure. *Purchased.*

Physiology. Complete articulated human skeleton. *Purchased.*

Pleuro-pneumonia in Pig.

Calf's Lungs, uninflated.

Anthrax. Specimen of Spleen affected.

Strongyhis Filaria in Lung of Sheep.

Connection for Closet Flush Pipe. Metallic clip for connecting flush pipe from waste preventor to arm of closet basin. *Mr. Fullerton.*

Lantern Slides. Four slides showing virulent form of small-pox. Eight slides showing the plague bacilli, and dissections of rats and guinea-pigs dead after inoculation with plague. *Purchased.*

CONTRIBUTIONS AND ADDITIONS TO LIBRARY

October to December, 1900.

⁂ *For publications of Societies and Institutions, &c., see under "Academies."*

ACADEMIES (American.)

Columbus. *American Public Health Association.* Reports and Papers of. Vol. XXIV., 1898. 406 pp., 8vo. Vol. XXV., 1899. 714 pp., 8vo. *The Association.*

ACADEMIES (British).

London. *Institution of Civil Engineers.* Minutes of Proceedings, with other selected and abstracted papers. Vol. CXLII. 528 pp., 8vo. London, 1900. List of Members, 1900. *The Institution.*

London. *City of London College.* Calendar, 1900–1901. 200 pp., 8vo. London, 1901. *The Principal.*

——— *Royal College of Surgeons of England.* Calendar, Aug., 1900. 353 pp., 8vo. London, 1900. *The College.*

——— *University College.* Calendar, Session 1900–1901. 501 pp., 8vo. London, 1900. *The College.*

ACADEMIES (DUTCH).

Amsterdam. *Royal Academy of Sciences.* Proceedings of the Section of Sciences. Vol. II. 661 pp., 4to. Amsterdam, 1900. Verslag van de Gewone Vergaderingen der Wis-en Natuurkundige afdeeling van 27 Mei, 1899, tot 21 April, 1900. Deel VIII. 774 pp., 4to. Amsterdam, 1900. *The Academy.*

Acland, *Henry Wentworth, M.D., F.R.S.* Memoir on the Cholera at Oxford in the year 1854, with considerations suggested by the Epidemic. 172 pp., 4to. London, 1856. *Purchased.*

Board of Agriculture. Agricultural Returns. Statistical Tables showing acreage under crops and grass, and number of horses, cattle, sheep, and pigs in the United Kingdom, with particulars of each County of Great Britain, 1900. 41 pp., 8vo. London, 1900. *The Board.*

Bruxelles. *Ville de.* Rapport concernant le service de l'hygiène, année 1899. 80 pp., 8vo. Bruxelles, 1900.

——— Rapports des Commissions médicales provinciales sur leurs travaux pendant l'année 1899: précédés des observations de l'Académie royale de médecine et du Conseil supérieur d'hygiène publique. 467 pp., 8vo. Bruxelles, 1900. *Ministère de l'Agriculture.*

Celli, *Prof. Angelo.* Malaria according to the new researches. Translated by J. J. Eyre, M.R.C.P., D.P.H.; with introduction by Dr. Patrick Manson. 275 pp., 8vo. London, 1900. *Purchased.*

Chicago. *Department of Health.* Biennial Report for years 1897 and 1898. 319 pp., 8vo. *Arthur R. Reynolds, M.D.*

Cochrane, *Miss C.* Labourers' Cottages: Three letters especially addressed to Agricultural Labourers. 7 pp., 8vo. St. Neots, 1900. *The Author.*

Curtis, *H. J., B.S., M.D., F.R.C.S.* The Essentials of Practical Bacteriology; an elementary laboratory book for students and practitioners. 291 pp., 8vo. London, 1900. *Longmans, Green & Co. (publishers).*

Diarrhœa. Certification and Classification of "Diarrhœa" Deaths. 24 pp., 8vo. Reprint "Public Health," October, 1900. *Rebman, Ltd. (publisher).*

Farrow, *F. R., F.R.I.B.A.* Stresses and Strains, their calculation and that of their resistances, by formulæ and graphic methods. 144 pp., 8vo. London, 1900. *D. Fourdrinier (publisher).*

Gaskell, *E. S.* Paralysis in our Daily Food. 4 pp., 8vo. *The Author.*

Genersich, *Von Dr. Wilhelm.* Typhus Epidemie. Durch Typhus bakterien infiziertes Trinkwasser. 8 pp., 8vo. Jena, 1900. *Prof. Fodor.*

Glen, *W. C. and A.* The Law relating to Public Health and Local Government. Vols. I. and II. Twelfth edition. 2209 pp., 8vo. London, 1899. *Purchased.*

Grimsby. Report of the Special Sub-Committee appointed for the purpose of considering the Ventilation of the Sewers of the Borough, together with the Report of the Borough Engineer (H. Gilbert Whyatt) on the subject. 28 pp., fcp. Grimsby, 1900. *H. Gilbert Whyatt, Assoc.M.I.C.E.*

Hair, *C. J., A.R.I.B.A.* Housing of the Working Classes. 16 pp., 8vo. Southampton, 1900. *The Author.*

Invercargill, New Zealand. Standing Orders and By-Laws. 125 pp., 8vo. *K. Cameron.*

Japan. The Sanitary Regulations of the Imperial Government. 98 pp., 8vo. Tokio, 1899.

——— Port Quarantine Law of the Imperial Government. 7 pp., 8vo. Tokio, 1899.

——— Regulations for the Enforcement of the Law of Port Quarantine. 11 pp., 8vo. Tokio, 1899. *Prof. Dr. S. Kitasato.*

Kaye, *J. R., M.B.* Report to West Riding C.C. on Tuberculosis. 8 pp., 8vo. Wakefield, 1900. *The Author.*

Keating, *J. M.* The Yellow Fever Epidemic of 1878 in Memphis, Tenn. 454 pp., 8vo. Memphis, 1879. *Purchased.*

Keith, *G. S., M.D., LL.D.* On Sanitary and other Matters. 126 pp., 8vo. London, 1900. *A. & C. Black (publishers).*

Kitasato, *Prof. Dr. S.* Bericht über die Pestepidemie in Kobe und Osaka von Nov., 1899 bis Januar, 1900. 126 pp., 8vo. Tokio, 1900. *The Author.*

Knight's Annotated Model Bye-Laws of the Local Government Board. Sixth edition. 276 pp., 8vo. London, 1899. *Purchased.*

Kotelmann, *Ludwig, Ph.D., M.D.* School Hygiene. 391 pp., 8vo. Syracuse, N.Y., 1899. *Purchased.*

Local Government Board. Dr. H. Timbrell Bulstrode's Report upon the Sanitary Condition of the Borough of Windsor, and upon the character of the Town Council's administration. 29 pp., fcp. London, 1900.

——— Dr. St. George Mivart's Report on the general sanitary circumstances of the Stroud Rural and Nailsworth Urban Districts, and on administration by the respective District Councils. 20 pp., fcp. London, 1900. *W. H. Power, F.R.S.*

London County Council. Bacterial Treatment of Crude Sewage. Third Report by Dr. Clowes and Dr. Houston. Experimental intermittent treatment of London Crude Sewage in the Coke Beds at Barking and Crossness. 78 pp., fcp. London, July, 1900. *Prof. Frank Clowes, D.Sc.*

McPherson, *J. A., Assoc.M.Inst.C.E.* Waterworks Distribution: a practical guide to the laying-out of systems of distributing mains for the supply of water to cities and towns. 154 pp., 8vo. London, 1900. *B. T. Batsford (publisher).*

Massachusetts. *Board of Health.* Sixty-third Annual Report, 1898–1899. 834 pp., 8vo. Boston, 1900. *The Board.*

——— A Sketch of the History of Public Art Instruction in Massachusetts. (Eight Educational Monographs), 276 pp., 8vo. Boston, 1900.

MEDICAL OFFICERS OF HEALTH REPORTS, &c.

Bermondsey, 1899 ..	.. *H. J. Dixon, M.D.*
Gloucester C.C., 1899	.. *Lieut.-Col. J. C. Griffith.*
Lancaster C.C., 1899	.. *E. Sergeant, M.O.H.*
London (Port of), half-year to June 30th, 1900 ..	.. *W. Collingridge, M.A., M.D.*
Montreal, 1899 ..	.. *Dr. Louis Laberge.*
Nottingham C.C., 1899	.. *H. Handford, M.D., F.R.C.P.*
Staffordshire C.C., 1899	.. *G. Reid, M.D., D.P.H.*
Toronto, 1899 ..	.. *C. Sheard, M.D.*
West Riding C.C., 1899	.. *J. R. Kaye, M.B.*

Michigan State Board of Health. Proceedings and Addresses of the Fourth General Conference of Health Officers in, on October 26th and 27th, 1899. 181 pp., 8vo. Lansing. *The Board.*

New York State Board of Health. Nineteenth Annual Report, 1898. 2 Vols. 771 pp., 8vo. New York, 1899. *The Board.*

Notter, *Prof. J. Lane, M.A., M.D., and* **Horrocks,** *W. H., M.B., B.Sc.* The Theory and Practice of Hygiene (Notter & Firth). Second Edition. 1,085 pp., 8vo. London, 1900. *J. & A. Churchill (publishers).*

Ohio State Board of Health. Preliminary Report of an Investigation of rivers and deep ground waters of Ohio as sources of public Water Supplies, 1897–1898. 259 pp., 8vo. Cleveland, 1898. Second Report, 1899. 284 pp., 8vo. Columbus, 1900. *The Board.*

O'Neill, *H., M.D.* Meat Inspection as conducted by the Municipal Corporations of Paris, Berlin, London, and Manchester, being a report presented to the Markets Committee of the County Borough of Belfast. 23 pp., 8vo. Belfast, 1900.

——— Housing of the Working, or Weekly Wage-earning Classes, being a Report presented to the Public Health Committee of Belfast. 26 pp., 8vo. Belfast, 1900.

——— The Inspection and Sterilisation of Milk, as conducted by several Municipal Corporations, the object being to ensure a supply of pure milk for the use of infants, aged, sick, and poor persons, being a Report presented to the Public Health Committee of Belfast. 37 pp., 8vo. Belfast, 1900. *The Author.*

Ontario. Public Health Act, 1897. 31 pp., 8vo. *State Board of Health.*

Ottawa. *Laboratory of Inland Revenue.* Bulletin No. 71: Cream and Tartar. No. 72: Cocoa and Chocolate. 9 and 12 pp., 8vo. Ottawa, 1900. *T. Macfarlane*

Pakes, *Walter C. C., D.P.H., F.C.S.* The Science of Hygiene. A Textbook of Laboratory Practice. 380 pp., 8vo. London, 1900. *Methuen & Co. (publishers).*

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NOTES ON LEGISLATION AND LAW CASES.

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LAND ACQUIRED FOR SPECIFIC PURPOSE.—*Powers of Local Authority—Application of Part not required to another Permanent Purpose—Local Government Board—Jurisdiction—Injunction—Public Health Act, 1875 (38 & 39 Vict., c. 55), s.s. 175, 176.*

Sect. 175 of the Public Health Act, 1875, which empowers the Local Government Board to direct that any lands acquired by a local authority in pursuance of any powers contained in the Act, and not required for the purpose for which they were acquired, shall not be sold, does not enable the Board to direct that those lands shall be applied permanently to any purpose inconsistent with the original purpose.

A local authority have no power to apply permanently land which they have acquired for one purpose to another purpose inconsistent with the original purpose, even though the land cannot possibly be required for that original purpose, and they will be restrained from so doing at the suit of the Attorney-General and the land owner from whom the land not required was purchased.

Decision of Kekewich, J. [1900] 1 Ch. 51 affirmed.

(ATTORNEY-GENERAL *v.* HANWELL URBAN DISTRICT COUNCIL.)

Div. Ct. [1900] C. A. 377.

UNSOUND FOOD. —*Destruction of—Duty of Magistrate—Public Health (London) Act, 1891 (54 & 55 Vict., c. 76), s. 47.*

Where proceedings are taken before a magistrate under s. 47 of the Public Health (London) Act, 1891, for the condemnation as diseased, or unsound, or unwholesome, or unfit for the food of man, of an article seized by a medical officer of health or sanitary inspector under the provisions of that section, the magistrate has no jurisdiction to enquire whether the article was intended for the food of man, but is bound to order its destruction upon being satisfied that it is in fact diseased, or unsound, or unwholesome, or unfit for the food of man.—(THOMAS *v.* VAN OS.)

Div. Ct., Q. B. [1900] 448.

LOCAL GOVERNMENT.—*Damage by reason of exercise of powers of Act—Costs of legal proceedings—"Full compensation"—Extra Costs—Public Health Act, 1875 (38 & 39 Vict. c. 55), s. 308.*

"Full compensation" for damage sustained by reason of the exercise of any of the powers of the Act under s. 308 of the Public Health Act, 1875, does not include extra costs of legal proceedings which have been ensured over and above the taxed party and party costs, by a person against whom the local authority has unsuccessfully proceeded under the Act.

Proceedings having been taken under ss. 94–96 of the Public Health Act, 1875, by the respondents, a local authority against the appellant in respect of a nuisance, an order to abate the nuisance was made against the appellant by the justices. He appealed against the order to quarter sessions, who dismissed the appeal, subject to a case. On the hearing of the case a Divisional Court ordered that the order of a quarter sessions should be quashed with costs, and that the respondents should pay to the appellant his costs of the appeal to the High Court to be taxed. The costs of the two appeals were taxed and paid to the appellant. In prosecuting the appeals the appellant reasonably incurred costs to a greater amount than the taxed costs which he received, and he claimed from the respondents the difference between the taxed costs and the amount so expended by him, as compensation under s. 308 of the Public Health Act, 1875:—

Held (affirming the decision of a Divisional Court [1900] 2 Q. B. 104), that he was not entitled to recover the amount so claimed by him.—(Barnett *v.* Eccles Corporation.)

C. A. 2 Q. B. [1900] 423.

NUISANCE. — *Injunction — Noxious Trade — Reasonable use of property.*

This was an action by the Attorney-General, at the relation of the board of works for the Wandsworth district, to restrain an alleged nuisance to the inhabitants of the neighbourhood.

The defendants carried on the trade of fat melters at Southfields, and the nuisance complained of was alleged to arise from noxious gases emanating from the defendants' works. The Court found that the defendants were carrying on their trade in a reasonable manner, and took precautions to prevent it from causing a nuisance to their neighbours.

Warrington, Q.C., and Lyttelton Chubb, for the Attorney-General.

S. O. Lawrence, Q.C., and Stewart-Smith, for the defendants.

Kekewich, J., in granting an injunction, said that his judgment in Reinhardt, *v.* Metasti (1889), 42 Ch. D. 685, had been much misunderstood. He thought there that when once the Court was satisfied that the defendant was creating a nuisance, the fact that he was doing what was reasonable from his own point of view was no defence. In Sanders-Clark *v.* Grosvenor Mansions Company, [1900] 2 Ch. 373, Buckley. J. appeared to think that the view taken by his Lordship in Reinhardt *v.* Metasti differed from the view of Lord Selborne, L.C., in Ball *v.* Ray (1873), L. R. 8 Ch. 467. Nothing could have been further from his intention. Reinhardt *v.* Metasti had also been criticised in Garrett on Nuisances as departing from Bamford *v.* Turnley (1860), 3 B. & S. 62; but he thought that it was entirely in accordance with the principles there laid down. The question might be put in this way: Could a man reasonably commit a nuisance? He thought that the answer to be gathered from Bamford *v.* Turnley was that he could not. If he was committing a nuisance he could not be said to be acting reasonably. In this case the defendants had taken precautions to prevent their trade from being a nuisance to their neighbours, and from their own point of view they were acting reasonably; but from the point of view above stated they were not acting reasonably, since upon the evidence they were committing a nuisance.—(ATTORNEY-GENERAL *v.* COLE.) C. D. (1900).

GENERAL NOTES.

PHYSIOLOGY FOR TEACHERS.—In a lecture on this subject, given at the Institute under the auspices of the Childhood Society, Prof. Sherrington, of Liverpool, set out the extent to which it was necessary that Physiology should be studied by teachers. He dwelt on the desirability of such studies being more particularly directed to that aspect of Physiology that has a practical application to child life, especially in schools. A knowledge of Physiology being of value to all teachers for guidance in the management of children entrusted to their care, although to a comparatively few for the purpose of direct teaching.

Such practical questions as the following are those with which every teacher would be confronted, and with which he ought to be able to deal wisely as a result of being trained to think judgmatically on physiological problems:—The interval to be allowed to children after a meal before resuming their lessons—The storing of energy by arranging for children to sit instead of to stand during an exhaustive lesson, as the heart of a child gives some 700 less beats during one hour of sitting than of standing—The most effective way of establishing cleanly habits in children is by giving intelligible reason for the rules of health as laid down by hygienists to the enquiries into the way of things so frequently made by children.

Prof. Sherrington shows the value to teachers of knowing the physiology of growth in guidance upon questions of food, breathing, personal cleanliness, and the pre-eminent help to a teacher which must always lie in the application of this knowledge to the working and management of the nervous system. The use of physical exercise is shown to be quite as much value in the education of muscular sense as in the augmentation of muscular force. Ambidexterity and the training for it, being a capital exercise in muscular sense. Describing the object of book-making to be to get the greatest amount of print into the smallest area with sufficient legibility, Prof. Sherrington points out that it all turns upon what is sufficient, for a child will never give the attention of its sight to what it cannot clearly see, and after showing some of the methods by which a child is frequently rendered short-sighted during school life, exclaims, "Is it too much to ask that the teacher should know the conditions of the seeing of a page of print?"

Prof. Sherrington referred to the syllabus of Practical Hygiene for School Teachers recently published by the Institute which he commended as setting out the branches and applications of the subject which it was desirable that a teacher should know.

BRITISH CONGRESS ON TUBERCULOSIS will be held in London, under the Presidentship of H.R.H. the Prince of Wales, July 22—26, 1901.

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APPENDIX.

PROGRAMMES OF ARRANGEMENTS.

FOR

CONFERENCE

ON THE

HOUSING OF THE WORKING CLASSES,

TO BE HELD IN THE

PARKES MUSEUM, MARGARET STREET,
LONDON, W.,

On MONDAY and TUESDAY, JULY 30th and 31st, 1900.

AND FOR

MEETING

TO BE HELD IN

PARIS,

ON

TUESDAY, WEDNESDAY, & THURSDAY, August 7th, 8th, & 9th, 1900.

IN CONJUNCTION WITH THE

SOCIÉTÉ FRANÇAISE D'HYGIÈNE.

CONFERENCE

ON THE

HOUSING OF THE WORKING CLASSES,

July 30th and 31st.

WITH a view to advancing the consideration of the problem of the Housing of the Working Class population in London, and other large towns, which presents so many difficulties in its solution, the Council of the Sanitary Institute have arranged to hold in the Parkes Museum a Conference on the subject.

In connection with the Conference an Exhibition of Plans and Models will be arranged.

The subject is one which is prominent in Parliament at the present time, and Mr. T. W. RUSSELL, the Parliamentary Secretary to the Local Government Board, speaking at a recent meeting of the Institute, expressed the opinion that when the general election comes on, this question of how to house the people will be one of the great issues upon which that election will be fought.

Local Authorities in London and the Provinces have been invited to send Delegates.

The date of the Conference (July 30th and 31st) is in the week preceding the visit of the Institute to Paris and the International Congress of Hygiene and Demography.

In the following pages will be found the proposed arrangements, which include Meetings for Discussion, Demonstrations at the Exhibition, and visits to typical examples of improved areas and dwellings.

PROGRAMME.

MONDAY, JULY 30th,

10 a.m. to 1.30 p.m.

CHAIRMAN—R. MELVILL BEACHCROFT, L.C.C.

Subject for Discussion.

Unhealthy Areas and Displacement of Town Populations.

SPEAKERS:

T. BLASHILL, F.R.I.B.A.
R. LANGTON COLE.
J. DOUGLASS MATTHEWS, F.R.I.B.A.
J. PRIESTLEY, B.A., M.D., D.P.H.
JOHN F. J. SYKES, D.Sc., M.D.
and others.

3 p.m.

VISITS TO

PROGRAMME.

TUESDAY, JULY 31st,

10 a.m. to 1.30 p.m.

CHAIRMAN—SIR SYDNEY H. WATERLOW, BART.

Subject for Discussion.

I. Improved Houses for Town Dwellers.

II. Improved Means of Communications.

SPEAKERS:

H. PERCY BOULNOIS, M.Inst.C.E.
C. J. HAIR, A.R.I.B.A.
MERVYN MACARTNEY.
J. PRIESTLEY, B.A., M.D., D.P.H.
and others.

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3 p.m.

VISITS TO

EXHIBITION OF PLANS AND MODELS

TO BE HELD IN

The Parkes Museum,

From JULY 30th to AUGUST 11th, 1900.

Plans and Models coming under any of the following heads will be accepted:

Unhealthy Areas and Improved Areas.

Urban Dwellings on the Systems of Self-contained Flats—Associated Flats—Family Houses—Poor Men's Hotels — Common Lodging Houses — Shelters.

Suburban Dwellings.

Rural Dwellings.

Hop and Fruit Pickers' Temporary Dwellings.

Model Estates, Villages, &c.

Models and Plans illustrating the application of Building Acts and Regulations.

Drawings may be sent strained or in frames. If unmounted plans are sent the greatest care will be taken of them, but the Institute cannot be responsible for accidental damage.

List of those who have promised Loan of Plans and Models for Exhibition.

Davies & Emmanuel.

Henry W. Dobb, M.S.A.

W. Goldstraw, Building Surveyor, Liverpool.

C. J. Hair, A.R.I.B.A.

W. Henman, F.R.I.B.A.

Josephs, Son & Smithies, Architects to the Guinness Trust.

Liverpool Town Council.

E. J. Lovegrove, M.Inst.C.E., Engineer and Surveyor, Hornsey District Council.

Mervyn Macartney.

J. Douglass Matthews, F.R.I.B.A.

T. de Courcy Meade, M.Inst.C.E., City Surveyor, Manchester.

James Munce, Assoc.M.Inst.C.E., Assistant City Surveyor, Belfast.

Spalding & Spalding, F. & A., R.I.B.A.

Ald. W. Thompson (Richmond).

W. Towers, Inspector of Buildings, Leeds.

W. E. Wallis, A.R.I.B.A., Surveyor to Peabody Donation Fund.

List of Sanitary Authorities appointing Delegates to the Conference.

Up to the end of May the following Authorities have appointed Delegates:

Aberdeen.
Barking.
Bath.
Batley.
Beckenham.
Bermondsey.
Blackrock.
Bradford.
Brentford.
Brighton.
Camberwell.
Cardiganshire C.C.
Carlisle.
Caterham.
Chelmsford.
Cheshunt.
Colne.
Croydon.
Denbigh.
Doncaster.
Edinburgh.
Esher and Dittons.
Essex C.C.
Farnham.
Faversham.
Finchley.
Gillingham.
Glasgow.
Hackney.
Hammersmith.
Hampton.
Hanwell.
Harrow.
Hendon.
Holborn.
Huddersfield.
Hull.
Lambeth.
Levenshulme.
Limehouse.
Liverpool.
Maidenhead.
Maidstone.
Manchester.
Mile End Old Town.
Montgomery C.C.
Nelson.
Neath.
Northumberland C.C.
North Riding, Yorks C.C.
Nottingham.
Ossett.
Plumstead.
Portsmouth.
Prestwich.
Rhondda.
Richmond.
Rochester.
Scarborough.
Scunthorpe.
Sevenoaks.
St. Albans.
St. James and St. John, Clerkenwell.
St. Marylebone.
St. Mary, Battersea.
St. Mary, Islington.
St. Mary, Newington.
St. Mary, Stoke Newington.
St. Olaves.
St. Pancras.
Shipley.
Southall Norwood.
Strand.
Tonbridge.
Tottenham.
Tunbridge Wells.
Twickenham.
Tynemouth.
Ventnor.
Walthamstow.
Walton-on-Thames.
Warrington.
West Bromwich.
West Ham.
West Suffolk C.C.
Whitechapel.
Wigan.
Willesden.
Wilts C.C.
Woking.
Wolverhampton.
Wood Green.
Worthing.

THE SANITARY INSTITUTE.

MEETING IN PARIS, 1900.

◆

INTRODUCTION.

THE Council have arranged to hold a meeting in Paris during the period of the International Exhibition.

The Société Française d'Hygiène have offered to the Members of the Institute a most cordial reception, and are providing a reception room and making arrangements for special visits and excursions for the benefit of the Members attending.

The date of the Meeting, August 7th, 8th, and 9th, has been arranged so as to follow the Conference to be held by the Institute in London on the Housing of the Working Classes and to immediately precede the meeting of the International Congress of Hygiene and Demography in Paris.

The arrangements will include the Reception, Addresses, and Lectures by the Presidents; Conferences of Medical Officers of Health, of Municipal Engineers, and of Sanitary Inspectors; visits to places of sanitary interest in Paris, and to the Exhibition.

On the following pages are set out the arrangements made and the general programme of the meeting.

As many Members will no doubt wish to remain in Paris for the meetings of the International Congress of Hygiene and Demography, arrangements have been made to include this longer period for those who desire it.

OFFICERS OF THE MEETING.

President:

Prof. W. H. Corfield, M.A., M.D.Oxon., F.R.C.P.Lond.
Consulting Sanitary Adviser to Her Majesty's Office of Works.
Membre Honorare Société Française d'Hygiène.

President of Société Francaise d'Hygiène:

Prof. Gréhant.

Vice-Presidents:

Dr. Ladriet de Lacharriere.

Presidents of Conferences:

A. Wynter Blyth, M.R.C.S., F.I.C., F.C.S.
Barrister-at-Law.
Medical Officer of Health, Marylebone.
T. de Courcy Meade, M.Inst.C.E.,
City Surveyor, Manchester.
W. H. Grigg,
Chairman of the Sanitary Inspectors' Association.
Membre Associé Etranger Société Française d'Hygiène.

French Secretary General:

Dr. Foveau de Courmelles,
Vice-President Société Française d'Hygiène.

French Assistant Secretary General:

Cecil Nicholson.

French Secretaries:

Dr. Blayac,
Medecin Inspecteur des Ecoles de la Ville de Paris.
M. Joseph de Pietra Santa.

Secretary of The Sanitary Institute:

E. White Wallis, F.S.S.,
Membre Associé Etranger Société Française d'Hygiène.

RECEPTION.

The Bureau of the Société Française d'Hygiène have courteously arranged to meet the Members on their arrival at the station on Monday evening, and the following gentlemen have been appointed as a Committee to make the necessary arrangements for the Reception and Entertainment of the Members during their stay in Paris. A List of the arrangements already in progress is given on page 14, and further Entertainment is under consideration.

RECEPTION COMMITTEE.

Dr. O'FOLLOWELL.
M. EDOUARD JOLTRAIN.
Dr. CHARLIER.
M. J. BRUHAT.
Dr. BARET.
M. MATHIS.
M. PION, *Inspector of the Veterinary Sanitary Service.*

ORDER OF PROCEEDINGS.

MONDAY, AUGUST 6th.

Reception of Members at Railway Station by Bureau of the Société Française d'Hygiène.

TUESDAY, AUGUST 7th.

MORNING.

9.30 a.m.—Reception of Members in the Grand Lecture Hall, Muséum, Jardin du Plantes.

Address of Welcome by Prof. GRÉHANT, President of the Société Française d'Hygiène.

Presidential Address by Prof. W. H. CORFIELD, M.A., M.D.OXON., F.R.C.P.LOND.

Lecture and Experiments in Laboratory by Prof. GRÉHANT, "Relating to his recent discoveries of Oxide of Carbon in the Blood, and the Grisomètre."

The Members of the Congress will then proceed by Steamboat from the Bridge of Austerlitz (near the Museum) down the Seine to the Exhibition, thus obtaining, in a short journey of half-an-hour, a fine view of the Paris Quays and the picturesque panorama of the Exhibition. Lunch will be served in one of the Restaurants in the Exhibition, perhaps on the first platform of the Eiffel Tower.

After Lunch visit to the Exhibition. (Lunch Tickets 5 francs.)

WEDNESDAY, AUGUST 8th.

MORNING.

Conference of Medical Officers of Health

(Preventive Medicine).

To be held in THE GRAND LECTURE HALL, MUSEUM, Jardin des Plantes.

10 a.m.—Address by the President, A. WYNTER BLYTH, M.R.C.S. ENG., F.I.C., F.C.S., *Medical Officer of Health for Marylebone*, opening discussion on "International Sanitary Regulations with regard to the prevention of Infectious Diseases."

Speakers:

AFTERNOON.

2 p.m.—Excursion. Visit to the Pavillion de la Ville de Paris.

THURSDAY, AUGUST 9th.

MORNING.

Conference of Engineers and Surveyors to County and other Sanitary Authorities.

To be held in THE GRAND LECTURE HALL, MUSEUM, Jardin des Plantes.

10 a.m.—Address by the President, T. DE COURCY MEADE, M.INST. C.E., *City Surveyor, Manchester*, introducing the following subjects:—"Purification of Sewage and the Prevention of Pollution of Rivers." "Open Spaces in Towns." "Planning, Construction, and Cleansing of Streets, including Subways under Streets."

Speakers:

Conference of Sanitary Inspectors.

To be held in THE COMPARATIVE ANATOMY LECTURE ROOM, MUSEUM, Jardin des Plantes.

Address by the President, W. H. GRIGG, *Chairman of Sanitary Inspectors' Association*, opening discussion on

Speakers:

AFTERNOON.

p.m.—Excursion.

The Authorities of the Museum have most courteously offered to admit Members attending the Meeting to visit the Zoological, Anatomical, Mineralogical, and other collections in the Museum.

VISITS AND EXCURSIONS.

Owing to the shortness of the time it is proposed to limit Excursions during the Meeting to the precincts of the Exhibition, as many may be taking the longer Excursions organised in connection with the International Congress of Hygiene and Demography.

The Afternoon of the 8th or 9th of August will be devoted to the Pavillon de la Ville de Paris, where, besides many interesting Exhibits relating to the history of this City, are to be seen Plans, Documents, etc., connected with the working of the Sanitary and Police organisation of the capital. Practical explanations will be given by the heads of different departments. Mr. Cecil Nicholson, Assistant Secretary-General will explain the various communications concerning the Exhibits. Visits may also be arranged to the Sewers, a Night Asylum, or the Sewerage Works, and Irrigation Farm at Gennevilliers.

TRAVELLING ARRANGEMENTS.

Privileges of Members and Non-Members.

Those joining the party who are not Members or Associates of the Institute will be considered Associates of the meeting, and will with the Members and Associates have the use of the Reception Room and the privilege of attending the meetings, and participating in any excursions arranged. The charge for tickets to Non-Members is rather more than to Members.

Institute Badges will be supplied to those attending the meeting at a cost of 2/- each (2f. 50c.)

Date and Time of Departure.

The day of departure is to be Monday, August 6th, and the Day Service will be taken if possible.

Travelling and Hotel.

The arrangements and responsibility for the Travelling and Hotel Accommodation have been undertaken by Messrs. T. Cook and Son, and Members will have the assistance of their Guides and Interpreters during the journey.

The prices include Railway and Steamer Tickets from London to Paris and back. Accommodation at Hotels, consisting of Meat Breakfast, Table d'Hôte Dinner, Beds, Lights, and Service for four, seven, or twelve days.

The four days' period includes starting from London on Monday and returning from Paris on Thursday.

Via Newhaven and Dieppe.

	MEMBERS.						NON-MEMBERS.					
GROUP A.	*First Class.*			*Second Class.*			*First Class.*			*Second Class.*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
4 Days ...	5	15	0	4	0	0	6	5	0	4	10	0
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12 „ ...	13	10	0	9	0	0	14	0	0	9	10	0

	MEMBERS.						NON-MEMBERS.					
GROUP B.	*First Class.*			*Second Class.*			*First Class.*			*Second Class.*		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
4 Days ...	5	0	0	3	10	0	5	10	0	4	0	0
7 „ ...	7	7	0	5	0	0	7	17	0	5	10	0
12 „ ...	11	0	0	7	10	0	11	10	0	8	0	0

In Group A the hotel accommodation is superior to Group B, and in both cases that for First Class ticket holders is superior to that for the Second Class.

To give a comparative idea of the hotel accommodation it may be stated that that for the Second Class ticket holder, Group A, is at Cook's best grade Exhibition Hotels, and the First Class in Group B is at Paris Hotels ranking rather higher than these.

EXTRA PAYMENTS.

Registration Fees for Luggage, 1/-; Transfer between Station and Hotel on arrival and departure from Paris, 2/-; Services of Messrs. Cook's interpreters on arrival and departure.

Guide Books to Paris and the Exhibition, published by Messrs. Boot & Son, London, 232 pp., Maps, Plans and Views; and by Messrs. Cook & Son, 144 pp., Maps and Plans, can be obtained at the Institute, price 1/-.

ALTERNATIVE ROUTE.

If desired by more than thirty, an alternative route can be arranged *via* Dover and Calais. The prices would be £1 First Class and 10/- Second Class in addition to the prices given above.

SPECIAL AND EXCEPTIONAL ARRANGEMENTS.

Members who are unable to adopt the arrangements set out should communicate at once with the Secretary, stating what they desire, as special arrangements can in some cases be made.

The homeward journey may be broken within the validity of the ticket at Amiens, Calais, or Boulogne, and Dover or Folkestone, as the case may be. If the passenger returns by the L.B. & S.C. Railway the journey could be broken at Rouen, Dieppe, Newhaven, Brighton, and Lewes.

The names of those who intend to join the party should be sent to the Secretary at the Office of the Institute, 72 Margaret Street, as soon as possible, as accommodation is limited and difficult to obtain.

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